

INSTRUCTION MANUAL AND PARTS LIST

GRIZZLY®
ULV SPRAYER

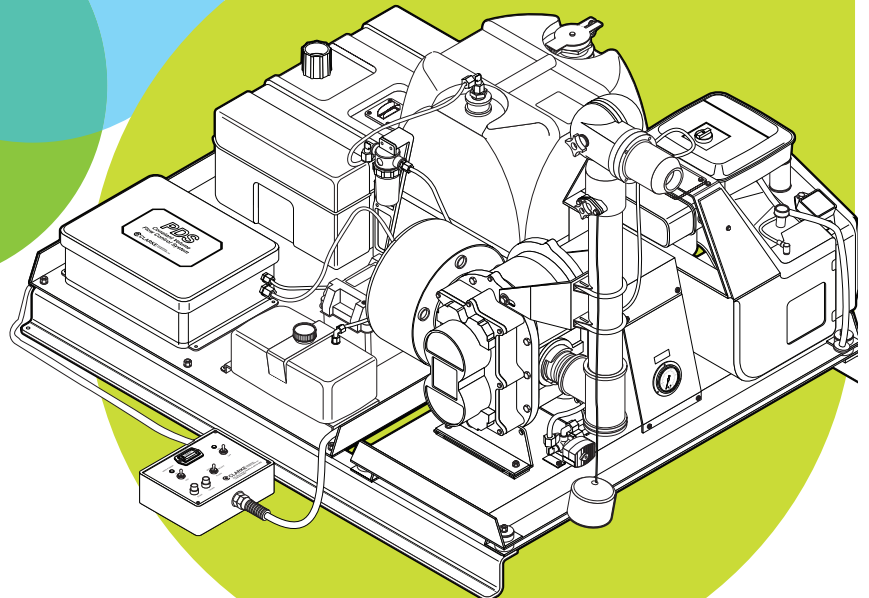


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Warranty Information

Clarke Engineering Technologies, Inc. (CETI) warrants that during the first year following the purchase of CETI manufactured products or equipment, such products or equipment will perform in accordance with the instruction manuals when properly installed, operated and maintained. During the warranty period, CETI's sole obligation and liability shall be at CETI's option to:

A. Replace or repair defective parts (including, at CETI's option, replacement of the entire unit) so that the unit will perform in accordance with the instruction manual.

OR

B. Refund the applicable payment upon return of the product.

Products requiring examination or repair under warranty must be returned postage/freight prepaid to the CETI factory in Rogers, MN. Examination and /or repair at locations other than the factory shall only be done upon authorization of CETI and by persons approved by CETI.

Components and accessories with electronic circuitry will carry the same warranty as the CETI machines provided they are installed at the factory or by an authorized factory representative. Field installations, modifications and /or the addition of other devices to CETI circuitry void this warranty. Aftermarket electronic items and parts such as "chips", "processors", etc. are not eligible for return, credit or warranty once the shipping package has been opened.

This limited warranty does not cover components or parts covered by warranties of other manufactures.

This limited warranty specifically excludes the cost of labor to customers or to other parties connected with the examination and /or repair of warranted products.

EXCEPT AS NOTED ABOVE, NO OTHER WARRANTY IS EXPRESSED, AND NONE SHALL BE IMPLIED, INCLUDING SPECIFICALLY ANY WARRANTY OF MERCHANTABILITY OF WARRANTY OF FITNESS FOR USE OR FOR A PARTICULAR PURPOSE. EXCEPT FOR THE FOREGOING, CETI SHALL HAVE NO LIABILITY TO CUSTOMER OR OTHER PARTY OR ANY GENERAL, SPECIAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE FAILURE OF THE PRODUCT(S) TO PERFORM AS WARRANTED, OF FOR ANY REASON.

THIS IS THE TOTAL EXTENT OF THE WARRANTY.

Clarke Grizzly Specifications

Manual Issue: Clarke Grizzly 4/05

Engine	18 HP Briggs and Stratton (570 cc)
Blower	Roots (350 CFM)
Dispersal Head	CLARKE IHPLAT
Fuel	Gasoline Min Octane
Fuel Tank Capacity	12 gallons (45.42 liters)
Flush Tank Capacity	1 gallon (3.8 liters)
Insecticide Tank Capacity	15 gallons (56.7 liters)
Droplet Size	90% less than 20 Microns
Flow Rate	Up to 18 oz/min (532.26 ml/min)*
Mounting Area	48" (121.9 cm) x 39" (99.0 cm)
Net Weight (Empty)	475 pounds (215 kilos)
Shipping Weight	534 pounds (242 kilos)
Shipping Cube	60.5 feet (1.71 meters)

* With standard 1/4" Piston. Larger pump heads available with flow rates up to 77 oz/min (2277 ml/min).

**THIS MANUAL IS FOR MY CLARKE COLD AEROSOL FOG
GENERATOR - GRIZZLY**

SERIAL NUMBER _____

**THE ABOVE INFORMATION, WHICH CAN BE FOUND ON THE CHASSIS,
SHOULD BE FILLED IN. YOUR PROMPT ATTENTION TO THIS MATTER WILL
MAKE IT CONVENIENT FOR YOU IN THE FUTURE, AS THIS INFORMATION
MUST BE GIVEN WHEN ORDERING PARTS.**

Every effort has been made to make this manual as complete as possible so that it will provide maximum assistance in operating and maintaining your CLARKE Grizzly Cold Aerosol Fog Generator.

Forward

This manual is divided generally into two sections - Operating and Maintenance Section and Illustrated Parts Section.

The Operating and Maintenance Section contains complete instructions for assembling, installing, operating and maintaining your CLARKE Grizzly Cold Aerosol Fog Generator. No difficulty should be encountered in following them.

Before attempting to start your unit the first time, study the complete Operation Instructions carefully and identify all parts referred to. You will find that the operation of your CLARKE Grizzly Cold Aerosol Fog Generator is a simple matter. However, like all mechanical equipment, your unit requires a certain amount of maintenance.

The Maintenance Instructions will enable your CLARKE Grizzly Cold Aerosol Fog Generator to give you continuous and trouble-free service. It is highly recommended that some system be established to assure the performance of this maintenance as its importance cannot be over-emphasized.

Although, with proper maintenance, your unit should operate indefinitely without any trouble, there might come a time when trouble does develop. For such an occasion, a complete Trouble Shooting Section has been prepared and included in this manual.

The Illustrated Parts Section of the manual is made up of exploded views and parts list. Every part of the unit is illustrated and identified with a part number. Always order parts by part number, description and the serial number of your unit.

 WARNING

THIS CLARKE GRIZZLY COLD AEROSOL FOG GENERATOR IS MANUFACTURED AND SOLD FOR USE ONLY WITH INSECTICIDES WHICH HAVE BEEN DULY REGISTERED AND APPROVED. DO NOT EXCEED THE DOSAGE SET FORTH ON THE REGISTRATION LABEL OF THE INSECTICIDE TO BE USED.

USE OF UNAPPROVED INSECTICIDES AND OR DOSAGE MAY BE HAZARDOUS

IMPORTANT

ONLY QUALIFIED PERSONNEL SHOULD OPERATE THE CLARKE GRIZZLY FOG GENERATOR

 WARNING

ALL SPRAY SWITCHES MUST BE IN THE "OFF" POSITION BEFORE THE IGNITION SWITCH IS TURNED ON.

SAFETY SUMMARY

1. **WARNING:** Observe all safety precautions set forth on the registration label of the insecticide to be used
2. **WARNING:** Never operate the fog generator in an enclosed area unless the exhaust gases are piped to the outside. Exhaust gases contain carbon monoxide, which is colorless, odorless and poisonous gas.
3. **WARNING:** Do not fill the fuel tank while the engine is in operation. Gasoline spilled on a hot engine may explode and cause serious injury to personnel.
4. **WARNING:** Do not attempt repairs in the insecticide system without protection until the system has been thoroughly flushed with a flushing solution for the insecticide used.

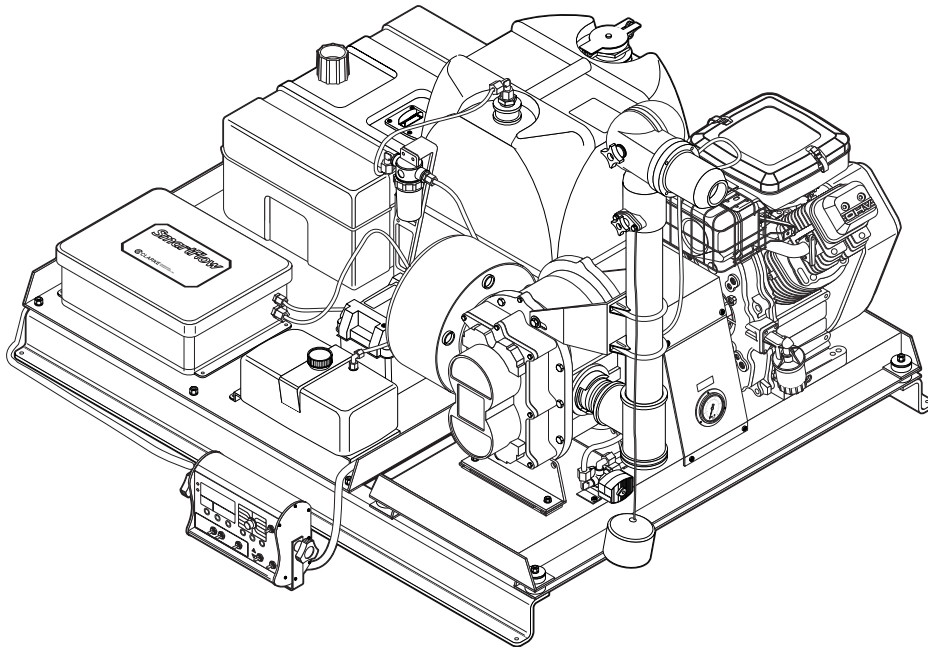
DESCRIPTION

GRIZZLY® ULV SPRAYER

This manual provides the description, theory of operation, assembling instructions, mounting instructions, operation instructions, calibration instructions, maintenance instructions and illustrated parts breakdown for the CLARKE Grizzly Cold Aerosol Fog Generator for Ultra Low Volume (ULV) application of insecticide.

Description

The CLARKE Grizzly Cold Aerosol Fog Generator consist of an engine with a fuel tank, a rotary blower capable of developing 10 P.S.I. maximum pressure, an adjustable discharge nozzle head assembly, a flow control, an insecticide tank, a flush tank, a remote cab control and a filter-silencer with a stainless steel element.



Theory of Operations

The CLARKE Grizzly Cold Aerosol Fog Generator is designed for precision metering of concentrated insecticide through the discharge nozzle head. Any desired flow rate, within limits, can be easily set on the flow rate scale. When fogging, the concentrated insecticide is drawn from the insecticide tank and pumped at the preset rate with constant, even flow to the discharge nozzle head where it is sheared into optimum size droplets by the air blast from the blower and dispersed into the atmosphere. After dispersal, the droplets stay suspended in the air and drift with prevailing winds to insect infested areas. The optimum size of a particular insecticide droplet is defined on the registration label for that insecticide and can be controlled by varying either the nozzle air pressure, the insecticide flow rate or both. Changing the speed of the engine will vary the nozzle air pressure. Slowing down the engine decreases the pressure which increases the droplet size because of less shearing action and conversely, speeding the engine up increases the pressure which decreases the droplet size for a particular flow rate. The correct flow rate will be defined on the registration label for that insecticide. As stated above, the flow rate also affects the droplet size. The droplet size tends to increase as the flow rate increases. Optimum size droplets must be maintained and should be checked periodically by an authorized person.

Particle Size

The air pressure at the nozzle and the volume of the chemical flow changes particle size. Particle size is specified on the label of the insecticide for that insecticide. This is a part of the label and a part of the legal use of that insecticide.

It is the responsibility of the user of the equipment and the insecticide to determine that the particle size developed by the ULV Cold Aerosol Fog Generator he is using is proper for the chemical that is being used. That is the law.

Insecticide labels discuss the determination of particle size and the suppliers of the insecticide should be equipped to measure, or help you measure, the particle size produced by your ULV Cold Aerosol Fog Generator. The ULV Cold Aerosol Fog Generator should not be operated unless the required particle size is known and measured.

Clarke Engineering Technologies, Inc. can not tell you what air pressure to use with a particular insecticide to get the particle size required by the label. There are too many variables involved, such as chemical mixture, flow rate and the temperature of the insecticide.

Your Clarke representative or distributor can work with you to be sure you are producing the correct particle size for the insecticide used.

Assembly Instructions

The CLARKE Grizzly Cold Aerosol Fog Generator is shipped completely assembled except that the Remote Control Box needs to be plugged into the socket located on the fog generator, see Figure 1, and The other end of the cable plug into the end of the pump box, see Figure 2 (See page 8). The plugs are polarized and can only be inserted in one position. Be sure to hand tighten the knurled locking cap onto the socket.

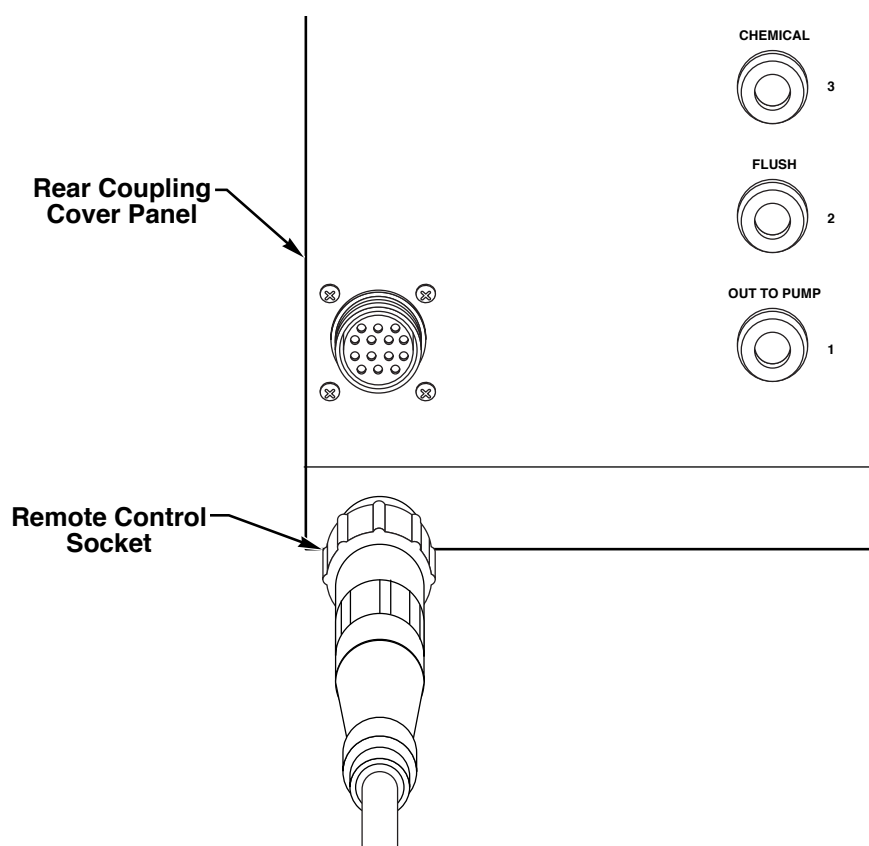


Figure 1- Remote Socket Connection

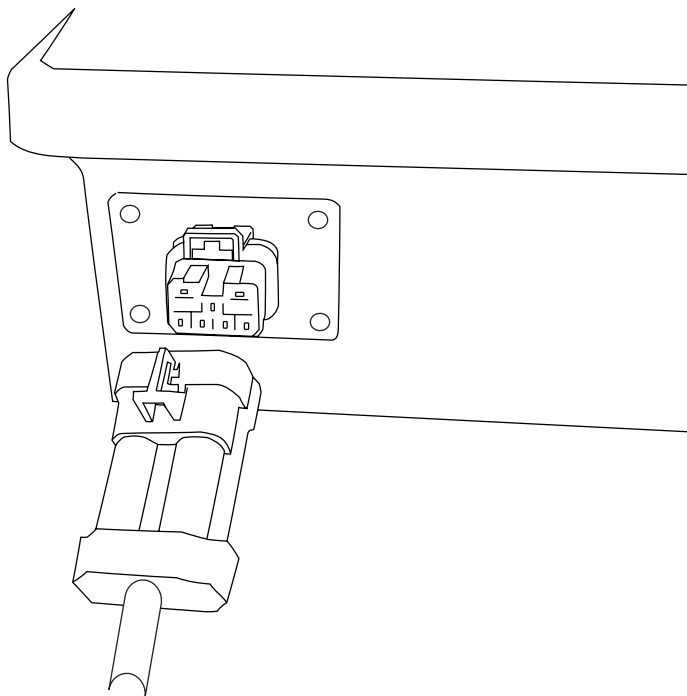


Figure 2- Remote Socket Connection on Pump Box

OPERATION

GRIZZLY® ULV SPRAYER

In order to eliminate vibration and excessive cab noise, the CLARKE Grizzly Cold Aerosol Fog Generator should be bolted to the bed of the vehicle, see Figure 3. Position the fog generator so that the nozzle is located towards the rear of the vehicle and all switches are easily accessible. Make sure that the fog generator is located where the insecticide tank can be easily filled. With the fog generator in the correct location, drill holes through the holes in the Z-base rails and fasten the unit to the bed with plated bolts. Mount the Remote Control Box in the cab of the vehicle in a convenient location. Route the cables back to the fog generator in a way that affords protection against cutting and snagging. Align the plug pins with the holes in the socket on the unit and lock the plug in place by hand tightening the knurled locking cap onto the socket. Plug the other cable on the socket on the Pump Box and snap into place.

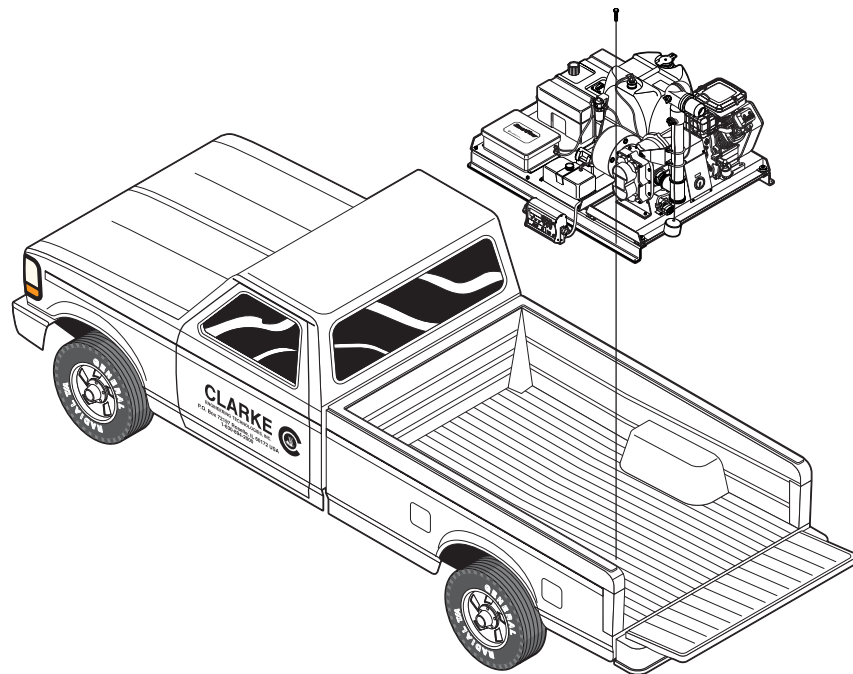


Figure 3- Truck Mounting

Note: Hearing protection must be worn when outside the vehicle in close proximity with the CLARKE Grizzly Cold Aerosol Fog Generator Cold Aerosol Fog Generator when it is running.

CAUTION
HEARING
PROTECTION
REQUIRED

The Remote Control Box connects to the CLARKE Grizzly Cold Aerosol Fog Generator through two multi-wire cable. Mount the small enclosure in the cab of the vehicle in a convenient location. Route the cables back to the CLARKE Grizzly Cold Aerosol Fog Generator in a way that affords protection against cutting and snagging. Plug the cable in and hand tighten the locking cap onto the socket.

The SmartFlow contains a number of components for controlling the unit. The purpose of each is as follows.

1. **RED TIME BUTTON:** This button displays the time that the ULV spray nozzle is turned on.
2. **MAIN POWER Switch:** This switch supplies power to start the engine and for the Flow Control to operate. With this switch in the OFF position, the engine will not start when cranked and the Flow Control will not operate.
3. **SPRAY Select Switch:** This switch sets the unit to either the spray inconstant or variable mode.
4. **FLUSH Switch:** This switch turns the flush on.
5. **ENGINE START Toggle:** This button cranks the engine.
6. **ENGINE CHOKE Toggle:** This button chokes a cold engine.

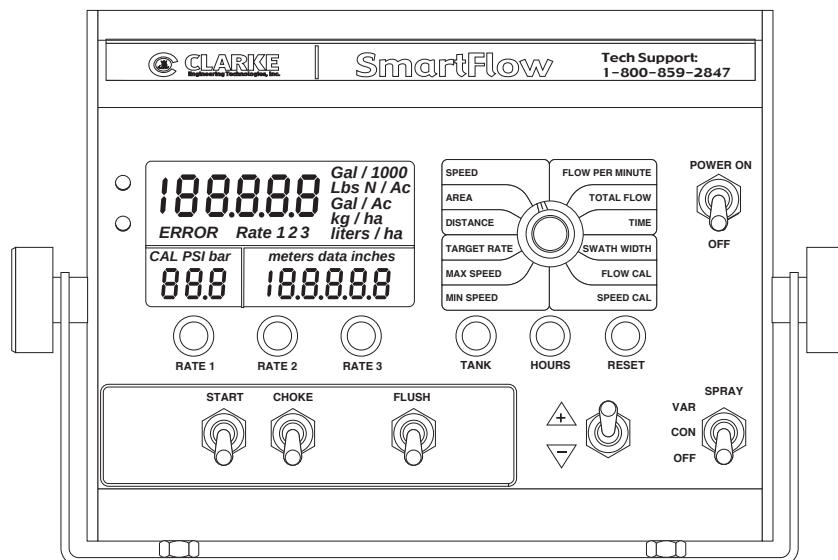


Figure 4- Remote Control Station

Read this complete OPERATION INSTRUCTIONS section before starting the CLARKE Grizzly Cold Aerosol Fog Generator.

When operating the CLARKE Grizzly Cold Aerosol Fog Generator for the first time, move to an uncongested and well-ventilated work area in an open area away from flammable materials.

Pre-Start

1. Make sure that all switches are in the OFF position.
2. Verify that the battery cable connections are correct and tight. This is a negative ground system.
3. Verify that no foreign objects or tools have been left in or about the fog generator.
4. Check the oil in the engine. If necessary, add oil until the level reaches the mark on the dipstick. The engine manual supplied with the fog generator will advise the correct oil to use. Reference Figure 4.
5. Check the oil and lubrication levels on the blower. See the LUBRICATION section on page 49.
6. Fill the gasoline tank. Reference Figure 5.

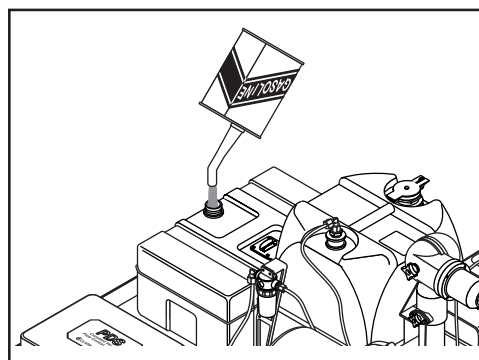
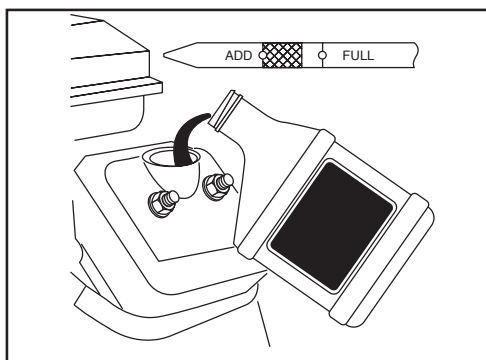


Figure 5- Fill engine Oil and Gasoline Tank

7. Service the insecticide tank with the appropriate insecticide. Always use a funnel with a strainer screen when adding insecticide to the tank. Reference Figure 6.
8. Place flushing solution in the flush tank. Reference Figure 6.

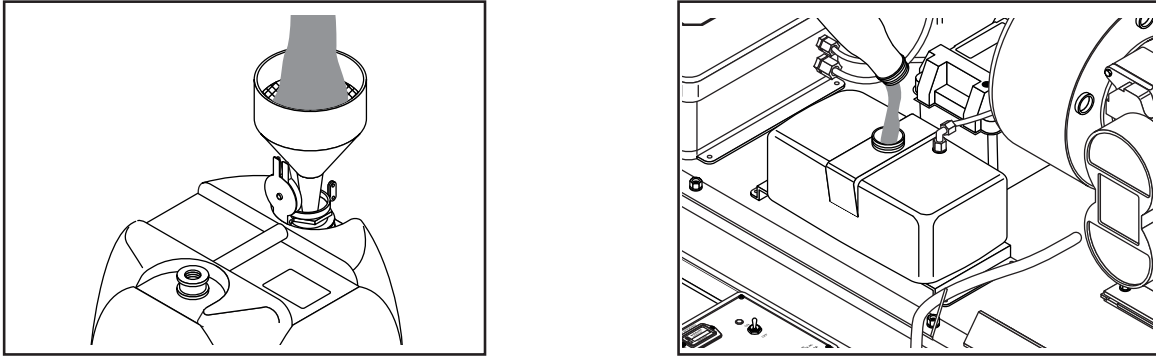


Figure 6- Filling Insecticide Tank and Flush Tank

9. Verify that the Remote Control Box is within easy reach of the operator.
10. Verify that the nozzle is in the correct position for spraying. The nozzle is adjustable both horizontally and vertically. To rotate the nozzle, loosen the appropriate knob on the side of the mast or side of the nozzle head and rotate the nozzle. Retighten the knobs after adjustment. Reference Figure 7.

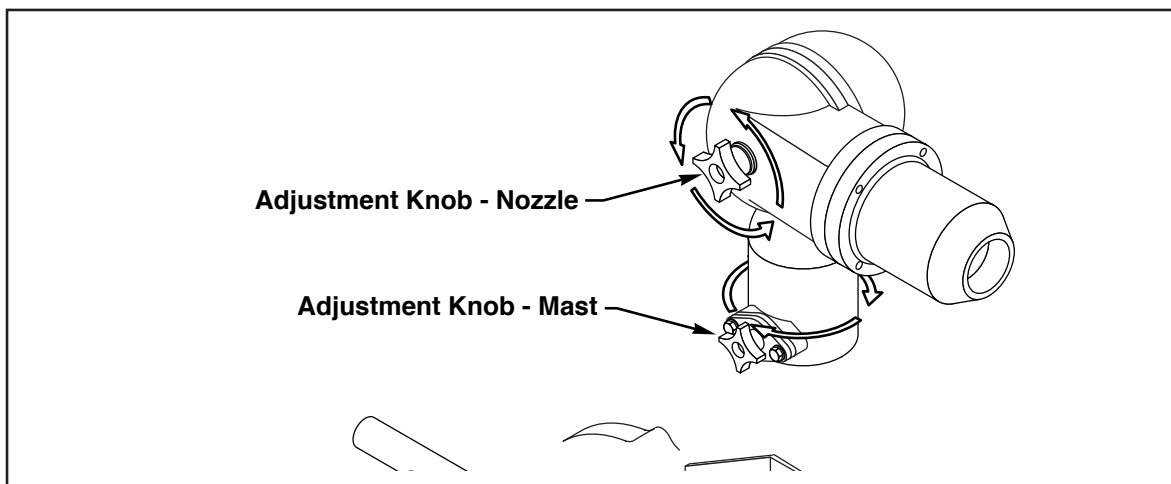


Figure 7- Nozzle Position

Start-Up

1. On the Remote Control Box, turn the Main Power switch to the ON position. Reference Figure 4.
2. On the Remote Control Box, set the Spray switch to the OFF position. Reference Figure 4.
3. For a cold engine, on the Remote Control Box, toggle the choke switch and starter switch at the same time, until the engine fires. Reference Figure 4.
4. For a hot engine, on the Remote Control Box, toggle the starter switch until the engine fires. Reference Figure 4.
5. When the engine fires release both the choke and starter switches.

Note: Pressing the start button on the engine will also start the engine. The Main Power switch on the Remote Control Box must be in the ON position for the engine to be started.

Note: Using short cranking cycles of several seconds provides the best starter life. Prolonged cranking can damage the starter motor if cranked more than 15 seconds per minutes.

Hour Meters

The unit is equipped with two separate hour meters. The hour meter mounted on the fog generator records the engine-blower RPM when the engine is running and the total engine-blower run time for service/maintenance and security when the engine is not running.

The red time button mounted on the Remote Control Box displays the time the ULV spray nozzle is turned on.

Pressure Gauge

The unit is equipped with a glycerin filled pressure gauge to read the nozzle air pressure and is mounted on the fog generator coupling guard between the engine and blower.

CONTROL PANEL FUNCTIONS

GRIZZLY® ULV SPRAYER

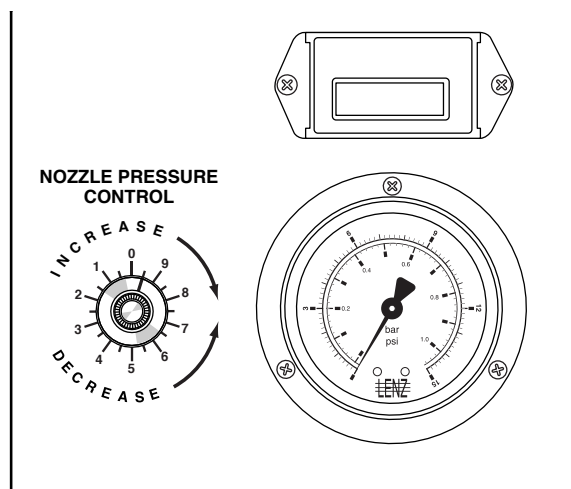


Figure 8- Pressure Gauge Panel

Low Pressure Cut-Off

The CLARKE Grizzly Cold Aerosol Fog Generator is equipped with an air low-pressure cut-off switch. If, for some reason, the nozzle air pressure drops below 1 P.S.I., the Flow Control will cut off. This prevents the blower from being filled with insecticide because of insufficient air blast. Because of this, the engine on the fog generator must be running when setting the flow rate.

The air low-pressure cut-off switch is located inside the coupling guard and is mounted on the rear of the pressure gauge. If necessary, this switch can be adjusted in the field by removing the rubber plug from the tip of the switch and then using a 7/32" Allen wrench, turn the adjustment screw in about 1/2 turn increments. Turning clockwise increases the air pressure cut-off point. Turning counter-clockwise decreases the air pressure cut-off point. See figure 9

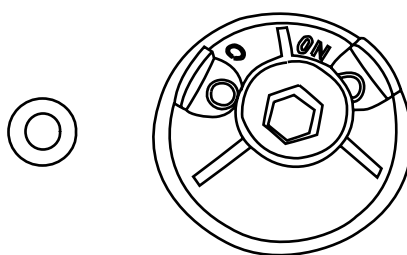


Figure 9 - Pressure Gauge Panel

Smart Flow Control

IMPORTANT

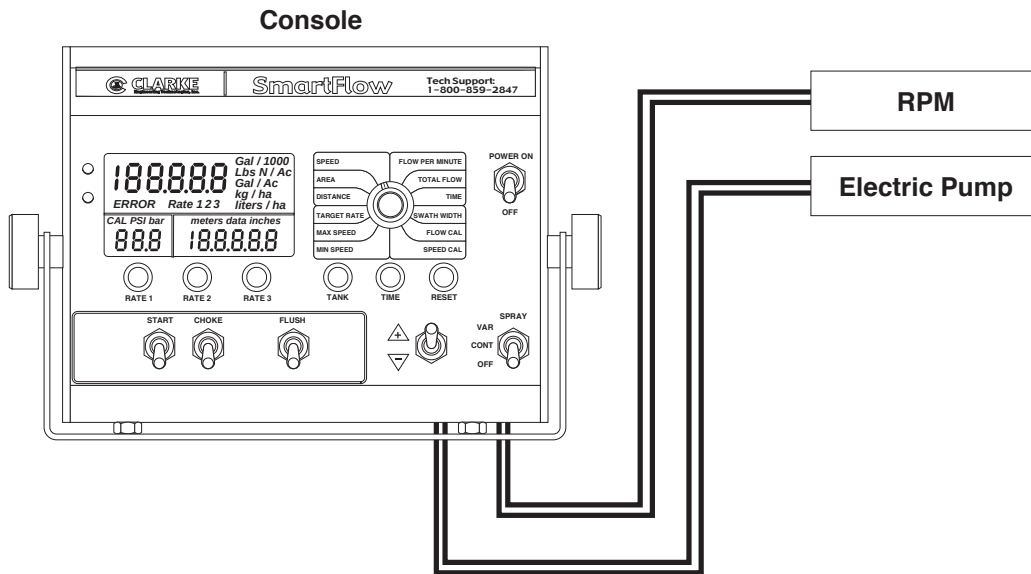
It is highly recommended that some system be established to assure the performance of the following maintenance instructions.

Installation, Operation and Maintenance Manual

Description

The Smart Flow control provides programmable microcomputer control for Clarke spraying systems. The Smart Flow control offers the following features:

- The Smart Flow control uses data from speed and flow sensor to vary the speed of the electric pump on the spraying system. This automatically maintains the target application rate.
- The Smart Flow control can operate alone, or for GPS-controlled Variable Rate Applications (VRA), it can use an RS232 Serial Link to send data to and receive commands from an external computer.
- Three different application rates can be preprogrammed into the Smart Flow control, allowing quick operator selection by the touch of a button.
- The Smart Flow control is available for both gas and electric spraying systems.
- For gas spraying systems, an optional pressure sensor can be installed so the user can monitor the application pressure.



Total Counters

The Smart Flow control accumulates the following totals to document spraying applications:

Counter	Description	Units
Total Flow	The amount of liquid applied since the counter was last reset.	Tenths of a gallon or tenths of a liter
Area*	The total application area since the counter was last reset.	Acres or hectares
Distance*	The distance the vehicle has traveled while spraying since the counter was last reset.	Miles or kilometers
Time	The spray time since the counter was last reset.	Hours
Hours	The cumulative spray time. This counter cannot be reset.	Hours

* Accumulate only in Variable mode.

Control Panel Functions

This section describes the functions of the control panel for the Smart Flow control. The control panel is the same for gas and electric spraying systems, except for the three controls on the lower left.

This section covers these control panel features:

- Alarm (page 18)
- Warning LED (page 18)
- Calibration LED (page 18)
- Display (page 20)
- Rotary Switch (page 23)
- POWER Switch (page 19)
- Buttons (page 25)
- Gas Controls (page 26)
- Electric Controls (page 26)
- +/- Switch (page 27)
- SPRAY Switch (page 28)

Alarm

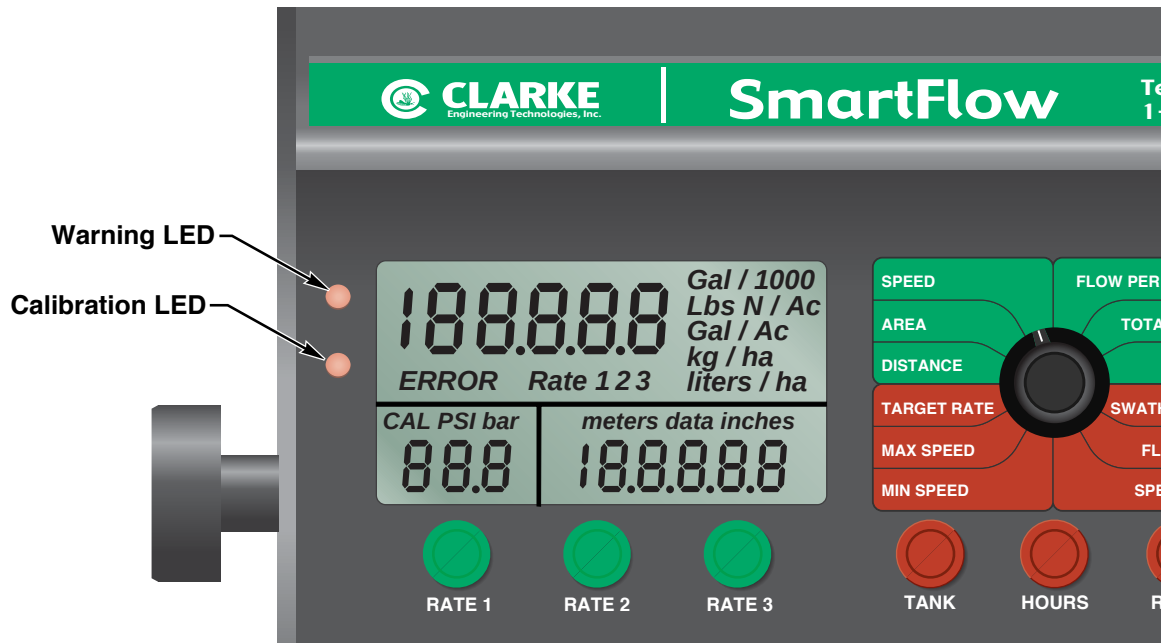
An audible alarm (beeper) sounds when there is an error. The warning LED and ERROR indicator in the upper display window will also be lit.

Warning LED

The warning LED is lit when there is an error. The alarm will sound and the ERROR indicator in the upper display window will also be lit.

Calibration LED

The calibration LED flashes when the control is in Calibration mode and the spray switch is in the OFF position. This indicates that calibration factors can be changed using the +/- (increase/decrease) switch.

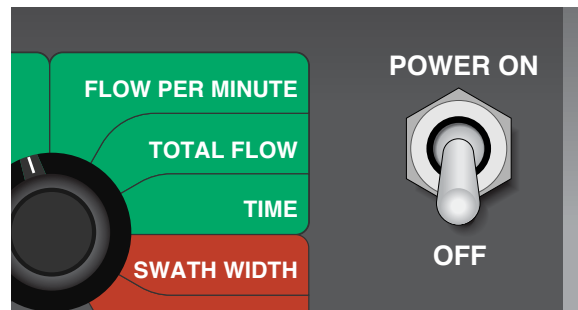


POWER Switch

The POWER switch turns the Smart Flow control on and off. In the OFF position, this switch also grounds the magneto on a gas spraying system or trips the main breaker on an electric spraying system.



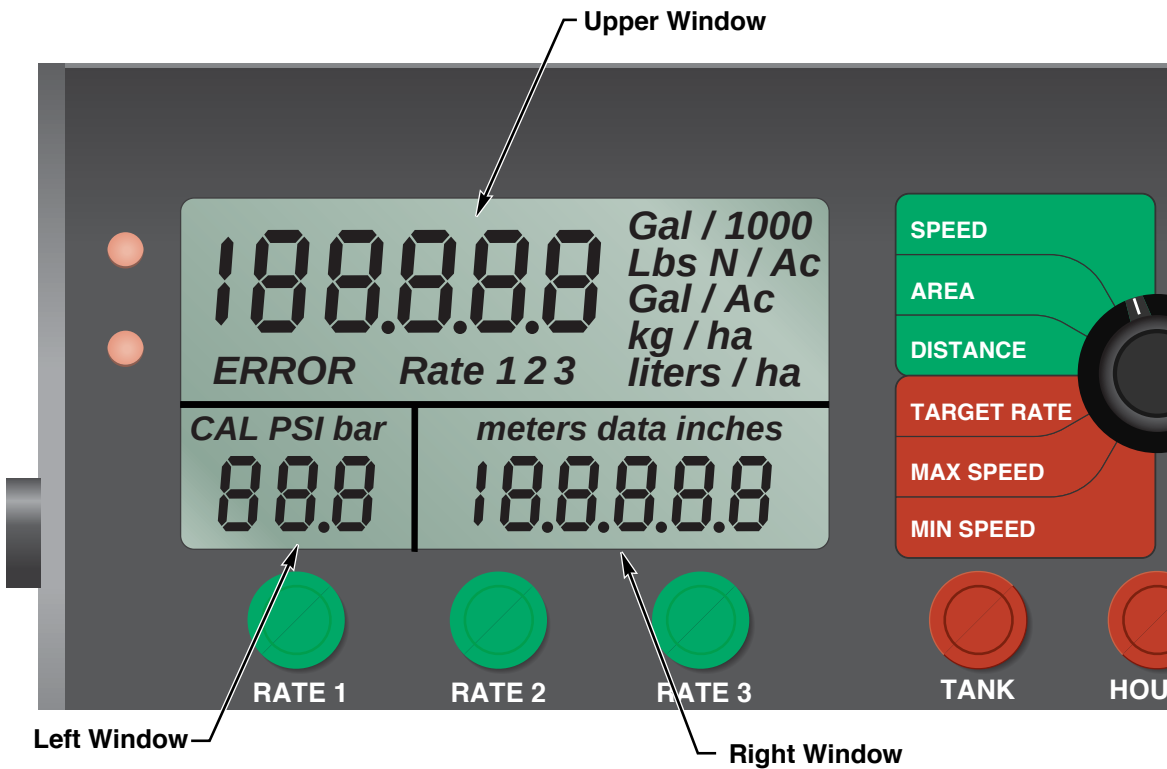
IMPORTANT: On an electrical spraying system, the power switch must be turned ON before the main breaker can be turned on.



Display

The display is used to view current values and calibration values. The display has three windows:

- Upper window
- Left window
- Right window



Upper Window

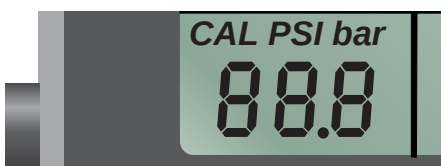
The upper window of the display is used to view the application rate, units, and errors.



Control	Description
Application rate digits	Variable or Continuous mode: The application rate is displayed in ounces per acre or liters per hectare. Off mode: OFF is displayed when the SPRAY switch is in the OFF position. PCOFF is displayed when an external computer issued an Off command. Calibration mode, rotary switch in Flow Cal position: The calibration flow amount (Cal Total Flow) is displayed. Calibration mode, rotary switch in Speed Cal position: The calibration distance (Cal Distance) is displayed. Calibration mode, rotary switch in other position: A message is displayed.
Unit indicators	English Units Selected When the application rate (ounces per acre) is displayed, the /Ac unit indicator is lit. When the TANK button is pressed, the Gal unit indicator is lit. Metric Units Selected When the application rate (liters per hectare) is displayed, the liters/ha unit indicator is lit. When the TANK button is pressed, no indicator is lit.
ERROR indicator	Indicates that the actual application rate is $\pm 10\%$ from the target application rate. If an error occurs for more than one second, the ERROR indicator is lit, and an error code is displayed in the left window. See “Troubleshooting” on page 43 for a description of the possible error codes.
Rate indicators	Variable or Continuous mode: Displays which of the preset target application rates is active. Calibration mode: Displays which target application rate is being adjusted.

Left Window

The left window of the display is used to view error codes and pressure codes (when a pressure sensor is installed for a gas spraying system).



Control	Description
Pressure digits	If a pressure sensor is installed, pressure is displayed in all modes. If an error occurs for more than one second, the ERROR indicator in the upper window is lit, and an error code is displayed in the left window. See “Troubleshooting” on page 43 for a description of the possible error codes.
CAL indicator	The control is in Calibration mode.
PSI indicator	English units (psi) are selected.
bar indicator	Metric units (bars) are selected.

Right Window

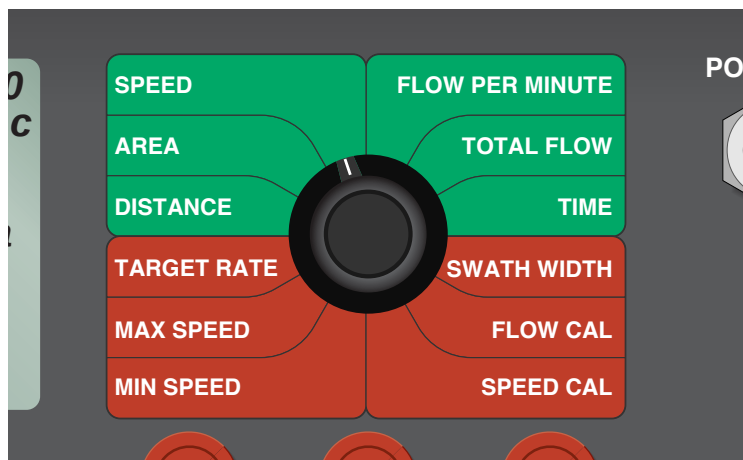
The right window of the display is used to view the values of rotary switch parameters.



Control	Description
Digits	Displays the value of the parameter selected on the rotary switch.
meters indicator	Metric units are selected and the Swath Width or Speed Cal parameter is selected on the rotary switch.
data indicator	The control is not in Calibration mode, so the value being displayed is not a calibration value.
inches indicator	English units are selected and the Speed Cal parameter is selected on the rotary switch.

Rotary Switch

The rotary switch is used to select the parameters to display and to set calibration values. The selected value is displayed in the right window of the display, along with the *data* indicator.

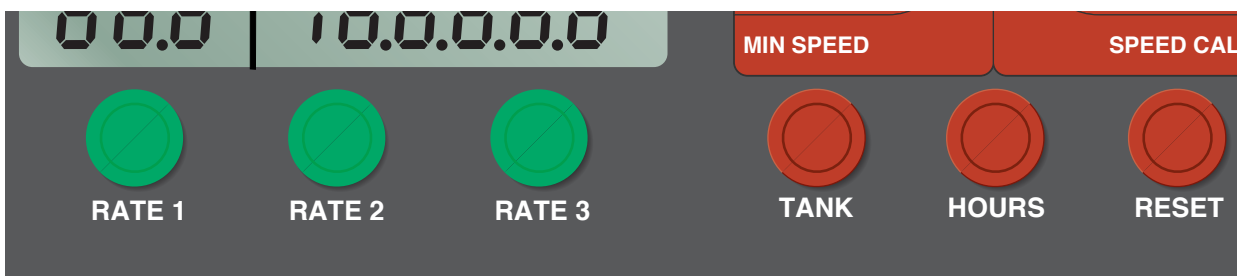


Control	Description
Green: Display Positions	
* Four of these positions are also used for calibration.	
SPEED	Displays the speed in miles per hour or kilometers per hour. In Continuous mode, flashes the Continuous Speed Cal value.
AREA	Displays the area treated since the counter was last reset, in acres or hectares. <i>OFL</i> indicates that the Area counter has exceeded 19999.9.
DISTANCE*	Displays the distance traveled since the counter was last reset, in miles or kilometers. In Continuous or Off mode, displays the last accumulated distance. In Calibration mode, sets the speed that is used in Continuous mode. <i>OFL</i> indicates that the Distance counter has exceeded 19999.9.
FLOW PER MINUTE*	Displays the flow volume in ounces per minute or liters per minute. In Calibration mode, sets the units to English or metric.
TOTAL FLOW*	Displays the total amount of liquid sprayed since the counter was last reset, in tenths of gallons or liters. <i>OFL</i> indicates that the Total Flow counter has exceeded 19999.9.

Control	Description
TIME*	Displays the total spray time since the counter was last reset, in tenths of an hour. <i>OFL</i> indicates that the Time counter has exceeded 19999.9.
Red: Calibration Positions	
TARGET RATE	Displays the target application rate in ounces per acre or liters per hectare. In Calibration mode, sets the target application rate.
MAX SPEED	Displays the maximum speed in miles per hour or kilometers per hour. In Calibration mode, sets the maximum speed.
MIN SPEED	Displays the minimum speed in miles per hour or kilometers per hour. In Calibration mode, sets the minimum speed.
SWATH WIDTH	Displays the width of the application area in feet or meters. In Calibration mode, sets the width of the application area.
FLOW CAL	Displays the number of flow sensor pulses generated per gallon or liter of flow. In Calibration mode, sets the number of flow sensor pulses.
SPEED CAL	Displays the distance traveled in feet or meters between speed sensor pulses. In Calibration mode, sets the distance traveled between speed sensor pulses.

Buttons

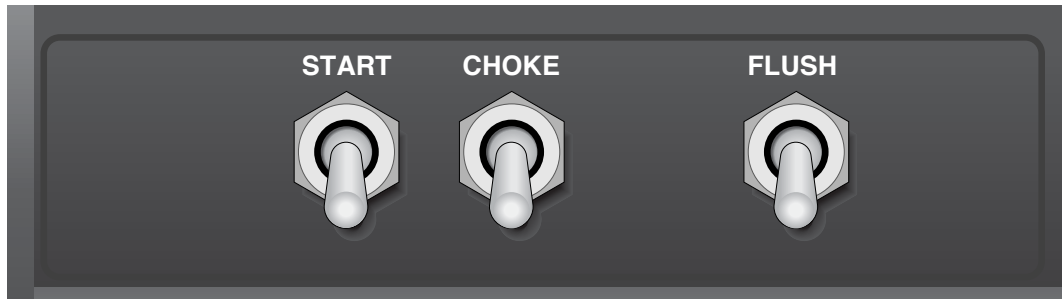
The buttons are used to select the application rate, display the tank level and spray time, and reset the counters.



Control	Description
RATE 1 button	Selects the first preprogrammed application rate.
RATE 2 button	Selects the second preprogrammed application rate.
RATE 3 button	Selects the third preprogrammed application rate.
TANK button	Displays the amount of liquid remaining in the tank, to the nearest 0.1 gallon or liter. Holding this button and using the +/- switch adjusts the tank volume (typically reset each time the tank is filled). The range is 0.1 to 6553.5 Gal or Liter.
HOURS button	Displays the Hours counter (total cumulative spray time) to the nearest 0.1 hour, up to 19999.9 hours. You cannot reset the Hours counter.
RESET button	When the rotary switch is in the AREA, DISTANCE, TOTAL FLOW, or TIME position and not in Calibration mode, pressing the RESET button for one second resets the associated counters (Area, Distance, Total Flow, and Time).

Gas Controls

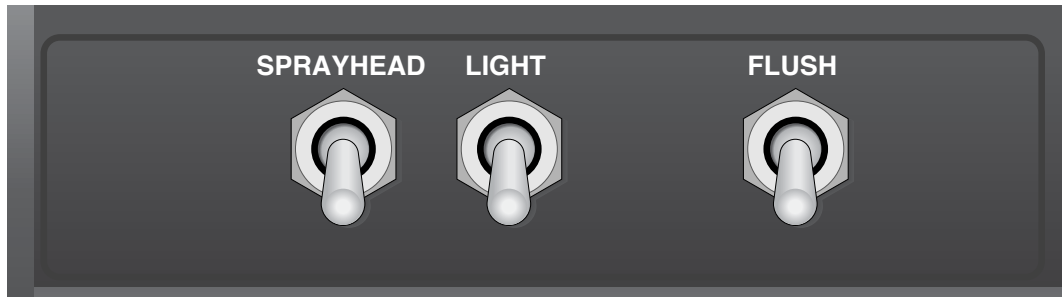
For a gas spraying system, the lower left controls are:



Control	Description
START switch	Starts the gas engine.
CHOKE switch	Chokes the gas engine.
FLUSH switch	Flushes the spraying system.

Electric Controls

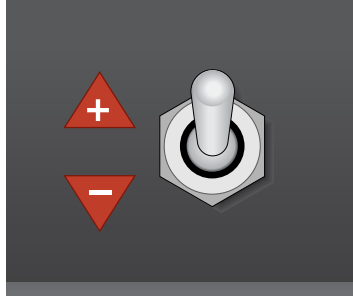
For an electrical spraying system, the lower left controls are:



Control	Description
SPRAYHEAD switch	Turns the sprayhead motor on (up) and off (down).
LIGHT switch	Turns the sprayhead light on (up) and off (down).
FLUSH switch	Flushes the spraying system.

+/- Switch

The +/- (increase/decrease) switch is used to enter or adjust values in the display.



Mode	Control	Description
VAR, CON or OFF spray mode	Press TANK button	This switch adjusts the tank volume. See “Adjusting Tank Volume” on page 40.
Calibrate mode	Place rotary switch in a calibration position	This switch adjusts the selected calibration factor. See “Calibration” on page 29.

SPRAY Switch

The SPRAY switch controls the spray mode.



Control	Description
VAR position	Variable Mode The Smart Flow control varies the pump speed to automatically maintain the selected application rate based on <i>flow and speed</i>. Total Flow, Distance, Time, Hours, and Area counters accumulate in this mode.
CONT position	Continuous Mode The Smart Flow control varies the pump speed to automatically maintain the selected application rate based on <i>flow only</i>. This mode can be used to spray while the vehicle is stopped. Total Flow, Time, and Hours counters accumulate in this mode.
OFF position	Off Mode The sprayer is stopped, and the Application Rate, Flow Per Minute, and Active Swath values go to zero. Total Flow and Tank counters accumulate in this mode in case flow does not stop immediately.

Calibration

This section covers these calibration topics:

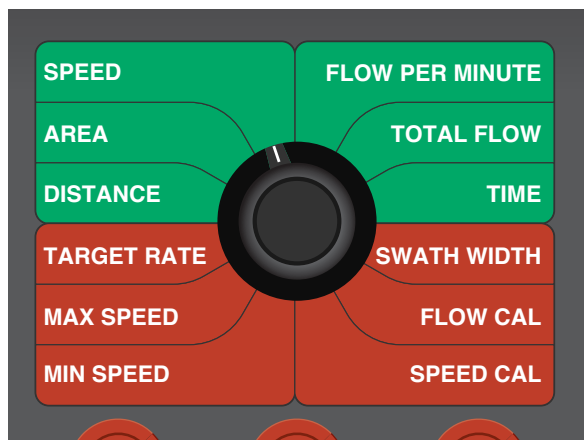
- Calibration Factors (page 30)
- Entering Calibration Mode (page 31)
- Exiting Calibration Mode (page 31)
- Setting Continuous Speed (page 32)
- Setting Units (page 32)
- Setting Target Application Rate (page 33)
- Setting Maximum Speed (page 33)
- Setting Minimum Speed (page 34)
- Setting Swath Width (page 34)
- Setting the Flow Calibration Factor (page 35)
- Determining the Flow Calibration Factor (page 35)
- Reloading Calibration Defaults (page 37)

Calibration Factors

The Smart Flow control has eight calibration factors:

Calibration Factor	Rotary Switch Position	Description
Continuous Speed	DISTANCE	The speed that is used in Continuous mode.
Units	FLOW PER MINUTE	The control can be set to use English or Metric units.
Target Rate	TARGET RATE	Sets the three preset Target Application Rates.
Maximum Speed	MAX SPEED	The maximum speed allowed in Variable mode. If the vehicle exceeds this speed, the control goes into Off mode until the speed goes below this number again.
Minimum Speed	MIN SPEED	The minimum speed allowed in Variable mode. If the vehicle goes below this speed, the control goes into Off mode until the speed exceeds this number again.
Width	SWATH WIDTH	The width of the application area; typically 300 feet for mosquito control applications.
Flow Cal	FLOW CAL	Specifies the number of flow sensor pulses per gallon applied. This enables the Smart Flow control to accurately measure total flow, flow per minute, and application rate.
Speed Cal	SPEED CAL	Specifies the distance the vehicle travels between speed sensor pulses. This enables the Smart Flow control to accurately measure speed, distance, area, and application rate.

Note: To view the first four factors in the previous table, you must place the control in Calibration mode. The last six factors can be viewed at any time by placing the rotary switch in one of the red positions.



Entering Calibration Mode

To place the Smart Flow control in calibration mode:

1. Move the rotary switch to the TARGET RATE position.
2. While holding the +/- (increase/decrease) switch in the + position, push and hold reset button for 2 seconds.
3. When the control has powered up, release the +/- (increase/decrease) switch.

SET is displayed in the upper display window, the CAL indicator is lit in the left display window, and the calibration LED flashes to indicate Calibration mode. Dashes are displayed in the right display window until a calibration factor is selected with the rotary switch.

Exiting Calibration Mode

To exit calibration mode and save changes, rotate the rotary switch to TARGET RATE, press and hold the RESET button for three seconds to save the change and exit Calibration mode. Any changes take effect immediately.

To exit calibration mode without saving changes, move the POWER switch to the OFF position.

Setting Continuous Speed

To set the speed that is used in Continuous mode:

1. Place the control in Calibration mode.
2. Move the rotary switch to the DISTANCE position.

SPEED is displayed in the upper display window, and the current Continuous Speed is displayed in the right display window.

3. Use the +/- (increase/decrease) switch to increase or decrease the speed. The possible range is 2.0 to 45.0 mph or kph.
4. Rotate the rotary switch to TARGET RATE, press and hold the RESET button for three seconds to save the change and exit Calibration mode.

Setting Units

To set the units to English or Metric:

1. Place the control in Calibration mode.
2. Move the rotary switch to the FLOW PER MINUTE position.

UnitS is displayed in the upper display window, and the current Units setting (Eng or MEt) is displayed in the right display window.

3. Use the +/- (increase/decrease) switch to toggle between English and Metric units.
4. Rotate the rotary switch to TARGET RATE, press and hold the RESET button for three seconds to save the change and exit Calibration mode.

Setting Target Application Rate

To set one of the three preset Target Application Rates for Variable and Continuous mode:

1. Place the control in Calibration mode.
2. Move the rotary switch to the TARGET RATE position.
3. Press the RATE 1, RATE 2, or RATE 3 button to select the Target Rate to be changed.

The selected rate indicator and current units are lit in the upper display window, and the current Target Application Rate is displayed in the right display window.

4. Use the +/- (increase/decrease) switch to increase or decrease the Target Application Rate. The possible range is 0.01 to 655.35 ounces per acre, or 0.001 to 65.535 liters/hectare. (The range may also be limited by the stroke of the pump.) A typical rate is 1 ounce/acre.
5. Rotate the rotary switch to TARGET RATE, press and hold the RESET button for three seconds to save the change and exit Calibration mode.

Setting Maximum Speed

To set the maximum speed allowed in Variable mode:

1. Place the control in Calibration mode.
2. Move the rotary switch to the MAX SPEED position.

Hi is displayed in the upper display window, and the current Maximum Speed is displayed in the right display window.

3. Use the +/- (increase/decrease) switch to increase or decrease the speed. The possible range is 2.0 to 45.0 mph or kph. A typical maximum speed is 20 mph.

Note: The Maximum Speed must be greater than the Minimum Speed, or the sprayer will not start.

Note: Setting the Maximum Speed to zero (0) disables the Maximum Speed limit.

4. Rotate the rotary switch to TARGET RATE, press and hold the RESET button for three seconds to save the change and exit Calibration mode.

Setting Minimum Speed

To set the minimum speed allowed in Variable mode:

1. Place the control in Calibration mode.
2. Move the rotary switch to the MIN SPEED position.

Lo is displayed in the upper display window, and the current Minimum Speed is displayed in the right display window.

3. Use the +/- (increase/decrease) switch to increase or decrease the speed. The possible range is 2.0 to 45.0 mph or kph. A typical minimum speed is 5 mph.

Note: The Minimum Speed must be less than the Maximum Speed, or the sprayer will not start.

Note: Setting the Minimum Speed to zero (0) disables the Minimum Speed limit.

4. Rotate the rotary switch to TARGET RATE, press and hold the RESET button for three seconds to save the change and exit Calibration mode.

Setting Swath Width

To set the width of the application area:

1. Place the control in Calibration mode.
2. Move the rotary switch to the SWATH WIDTH position.

Wdth is displayed in the upper display window, and the current Swath Width is displayed in the right display window.

3. Use the +/- (increase/decrease) switch to increase or decrease the Swath Width. The possible range is 0.0 to 6553.5 feet, or 0.00 to 655.35 meters. A typical swath width is 300 feet.
4. Rotate the rotary switch to TARGET RATE, press and hold the RESET button for three seconds to save the change and exit Calibration mode.

Setting the Flow Calibration Factor

To set the Flow Cal factor:

1. Place the control in Calibration mode.
2. Move the rotary switch to the FLOW CAL position.

The calibration flow amount (Cal Total Flow) is displayed in the upper display window, and the current Flow Cal factor is displayed in the right display window.

3. Use the +/- (increase/decrease) switch to increase or decrease the Flow Cal factor. The possible range is 0.00 to 6553.5 pulses per gallon.

Note: The Cal Total Flow in the upper display window will change to reflect the new Flow Cal factor.

4. Rotate the rotary switch to TARGET RATE, press and hold the RESET button for three seconds to save the change and exit Calibration mode.

Determining the Flow Calibration Factor

This procedure is used if the target rate needed is not within default target rate span. The default target rate span is approx. .5 ounces to 2 ounces per acre.

If target rate can not be made, flow cal factor must be adjusted. This means that the pump stroke must be adjusted and the smartflow must be recalibrated.

Note: Formula to calculate pump flow rate:

$$\text{speed} \times \text{swath} \times \text{target rate (ounces per acre)} / 495 = \text{pump rate (ounces per minute)}$$

This is a two step process.

1. calibrate pump (example- 12 ounces per minute.)

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1-800-859-2847*

2. calibrate smartflow to pump.
 - a. get into cal mode.
 - b. set the continuous speed, swath width, and target rate 1 calibration factors. these will be used to operate the pump at the desired rate. (example – 10 mph, 300 ft. swath width, and 2.5 ounces per acre.)
 - c. turn rotary switch to flow cal.
 - d. reset display to zero by pushing reset button.
 - e. start sprayhead and turn pump on and pump out a
 - f. measured amount. (min. 20 ounces)
 - g. shut off pump and adjust display with +/- switch
 - h. until display reads the actual ounces you pumped
 - i. push reset till display reads off to store results.

** please call our technical services hotline if you have any questions about this procedure.
1-800-859-2847*

Reloading Calibration Defaults

Normally, the calibration settings that were in use when the Smart Flow control was turned off will be active when the control is restarted. However, you can reload the default calibration settings during startup as follows:

Note: This procedure also clears the Total Flow, Area, Distance, Time, and Tank counters and disables the Pressure offset.

English Units: To load English default calibration settings, press and hold the RATE 1 button and hold the +/- (increase/decrease) switch in the + position while moving the POWER switch to the ON position.

Metric Units: To load Metric default calibration settings, press and hold the RATE 2 button and hold the +/- (increase/decrease) switch in the + position while moving the POWER switch to the ON position.

The calibration default settings are as follows:

Calibration Factor	English	Metric
Target Rate 1	1.0 ounces/acre	0.073 liters/hectare
Target Rate 2	1.0 ounces/acre	0.073 liters/hectare
Target Rate 3	1.0 ounces/acre	0.073 liters/hectare
Swath Width	300 feet	91.44 meters
Speed Cal (UPP)	1.03 inches/edge	.026 meters/edge
Flow Cal (PPG)	2660.0 PPG	2660.0 PPG
Minimum Speed	2.0 mph	3.2 kph
Maximum Speed	22.0 mph	35.4 kph
Units	English	Metric
Continuous Speed	10 mph	16.0 kph
Regulator Constant	5	5
Control Threshold	100	100
Pressure Offset	255(Off)	255(Off)

Operation

This section covers these operating procedures:

- Startup (page 38)
- Selecting the Application Rate (page 39)
- Shutdown (page 39)
- Clearing Counters (page 39)
- Adjusting Tank Volume (page 40)
- Setting the Pressure Offset (page 40)

Startup

To start the Smart Flow control:

1. Move the POWER switch to the ON position.
2. If *bAD* appears in the upper display window and the CAL indicator in the left display window is lit:
 - a. Press the RESET button.
 - b. Check and correct all calibration factors.
 - c. Check and correct any counters that may have overflowed (Total Flow, Area, Distance, Time, and Hours).
3. Select the desired application rate by pressing the RATE 1, RATE 2, or RATE 3 button.
4. Start the sprayer:
 - For a gas model, press the START button.
 - For an electric model, turn on the main breaker, and place the SPRAYHEAD switch in the UP position.

Note: For specific startup procedures, see the Instruction Manual for your spraying system.

5. Place the Spray switch in the desired position (see “SPRAY Switch” on page 28):
 - VAR = Variable mode

Selecting the Application Rate

To select a preset application rate, press the desired rate button (RATE 1, RATE 2, or RATE 3). In the upper display window, the selected rate indicator is lit.

If the SPRAY switch is in the VAR or CON position, the selected rate is displayed for three seconds. If the SPRAY switch is in the OFF position, the upper display window will still display OFF, but the new application rate will be selected.

Shutdown

To shut down the Smart Flow control:

1. Place the SPRAY switch in the OFF position.
 2. Stop the sprayer.
 - For an electric model, place the SPRAYHEAD switch in the DOWN position.
 - For a gas model, the Smart Flow control is not involved in stopping the sprayer.
- Note:** For specific shutdown procedures, see the Instruction Manual for your spraying system.
3. Press the FLUSH switch. Flush the spraying system for at least one minute to completely flush the lines.
 4. Move the POWER switch to the OFF position.

Clearing Counters

To clear the Total Flow, Area, Distance, and Time counters:

1. Make sure that the Smart Flow control is not in Calibration mode.
2. Move the rotary switch to the TOTAL FLOW, AREA, DISTANCE, or TIME position.
3. Press the RESET button for 1 second.

All four counters are reset to zero.

Adjusting Tank Volume

You should adjust the tank volume to match the actual volume of liquid in your tank each time you fill the tank. To adjust the tank volume:

1. Make sure that the Smart Flow control is not in Calibration mode.
2. Press and hold the TANK button.
3. Move the +/- (increase/decrease) switch to adjust the value displayed in the upper display window. The range is 0.1 to 6553.5 gallons or liters. A typical tank is 15 gallons.

Setting the Pressure Offset

If a pressure sensor is installed on your gas spraying system, use the following procedure to adjust the pressure offset (zero the pressure sensor):

1. Make sure that the Smart Flow control is not in Calibration mode.
2. Move the SPRAY switch to the OFF position.
3. While holding the HOURS button, move the +/- (increase/decrease) switch to the – position.

The pressure in the left display window is reset to zero, and a new pressure offset is stored.

Note: The pressure offset can be reset to zero by reloading the calibration defaults.

Troubleshooting

This section covers these troubleshooting topics:

- Warning Signals (page 41)
- Error Codes (page 41)

Warning Signals

If an error occurs for more than one second, the following occur:

- The warning LED is lit.
- The audible alarm beeps.
- The ERROR indicator in the upper display window is lit.
- An error code is displayed in the left display window.

Error Codes

When an error occurs, one of the following error codes is displayed in the left display window:

Error Code	Description
1	The <i>Pressure OK</i> and <i>RPM OK</i> inputs are both low. (This error occurs only in Variable or Continuous mode.)
2	In Continuous mode, the <i>Pressure OK</i> and <i>RPM OK</i> inputs are high, but there is no flow signal.
3	In Variable mode, the <i>Pressure OK</i> and <i>RPM OK</i> inputs are high and speed is within the minimum and maximum limits, but there is no flow signal.
4	In OFF mode, flow is still being detected.
5	Condition - Flush button pushed, pump not running.

Maintenance

IMPORTANT

It is highly recommended that some system be established to assure the performance of the following maintenance instructions.

General

- Replace worn or damaged parts on the CLARKE Grizzly Cold Aerosol Fog Generator.
- Service the engine according to the Engine Maintenance Manual. The engine is equipped with a replaceable oil filter. Reference Figure 5.
- Service the blower according to the Blower Maintenance Manual and the Blower (page 46) section.

Daily

- Visually check the fog generator each day before use and make any necessary adjustments and / or repairs.
- Crank the engine and check the nozzle air pressure as indicated on the pressure gauge on the fog generator. If the pressure varies more than + or - 1/2 P.S.I. from the preset pressure range, readjust the nozzle air pressure. See Adjusting the Nozzle Air Pressure (page 13)
- After use of the fog generator, flush the insecticide system with a suitable flushing solution.

Every 50 Hours

- Check the flow rate calibration. See Setting the Flow Calibration Factor (page 35) and Calibration Factors (page 30).
- Check all bolts and fasteners and tighten if necessary.
- Check all gasoline hoses, insecticide lines and fittings for cracks, leaks or wear. Replace if needed.
- Check all nozzle parts for wear or physical damage. Replace damaged parts.
- Remove and clean the element in the filter-silencer as follows. Reference Figure 10.
 - a. Remove the wing nut and washer.
 - b. Remove the cover and element.
 - c. Clean the inside of the housing and the element as required. If the element is damaged or bent, replace with a new one.
 - d. Replace the element, cover, washer and wing nut.

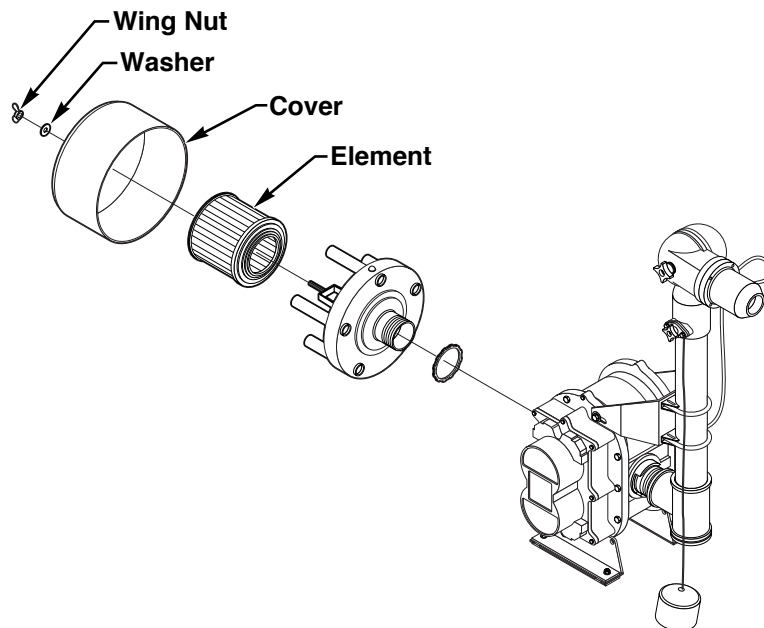


Figure 10- Element Replacement

Every 100 Hours

- Clean the insecticide filter. If this filter becomes stopped up, the insecticide flow will be restricted or stopped. There is a fine mesh screen located in the cylindrical housing. This screen can be removed for inspection and/or cleaned by manually unscrewing the housing bowl. Reference Figure 11.

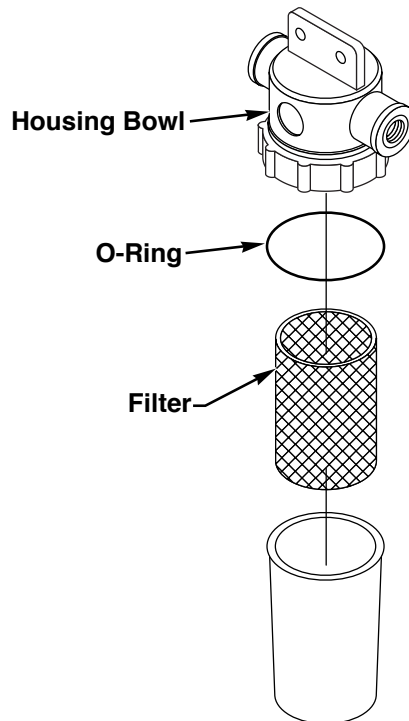


Figure 11- Insecticide Filter

- Check the battery voltage. Test the battery with a volt-ohmmeter. Connect the positive (+) meter lead to the positive (+) battery terminal. Connect the negative (-) meter lead to the negative battery terminal. Set the meter on volts. If the meter reads 11.5 to 12 or more volts, the battery is OK. If the meter reads less than 11.5 volts, check the specific gravity of the electrolyte. See below for instructions on checking specific gravity of the electrolyte.
- Check the battery electrolyte. Remove the battery vent caps and check the electrolyte level. Add clean distilled water if necessary to cover the battery plates. Check the specific gravity of the electrolyte with a hydrometer. If the specific gravity is between 1.250 and 1.280, the battery cell being tested is OK. If the specific gravity is between 1.225 and 1.250, the battery cell being tested is still in fair condition. If the specific gravity is below 1.150 in any one cell, replace the battery. If the specific gravity in one cell is 0.050 more or less than the other cells, and charging does not bring the charge to a 50% charge, replace the battery.

- Replace the in-line gasoline filter. Using pliers, loosen the tension on the two hose clamps and slide them off of the filter barbs. Remove the old filter from the gasoline hose. Install a new filter and replace the hose clamps. New filters can be installed with the direction of flow going either way. Never reverse an old filter. Reference Figure 12.
- Check the pulsation dampers. The metering pump used on the fog generator tends to deliver a slightly pulsating flow of insecticide. For best aerosol particle size, a more even (non-pulsation) flow is desirable. A small air chamber pulsation damper is located in the metering pump outlet line between the pump and the discharge nozzle. It is a nylon assembly with an air dome that can be unscrewed by hand for inspection. There is a gasket that seals the joint between the air dome and the lower housing. The air dome should be checked periodically to make sure that it has not become filled with insecticide. If the dome has no air in it, it will not function as a pulsation damper. When reassembling, be sure that the sealing gasket is properly positioned so as to avoid damage caused by pinching. Applying a light coat of oil or grease will prevent pinching the gasket. Tighten the housing only hand tight when reinstalling. Do not use tools. Reference Figure 12.

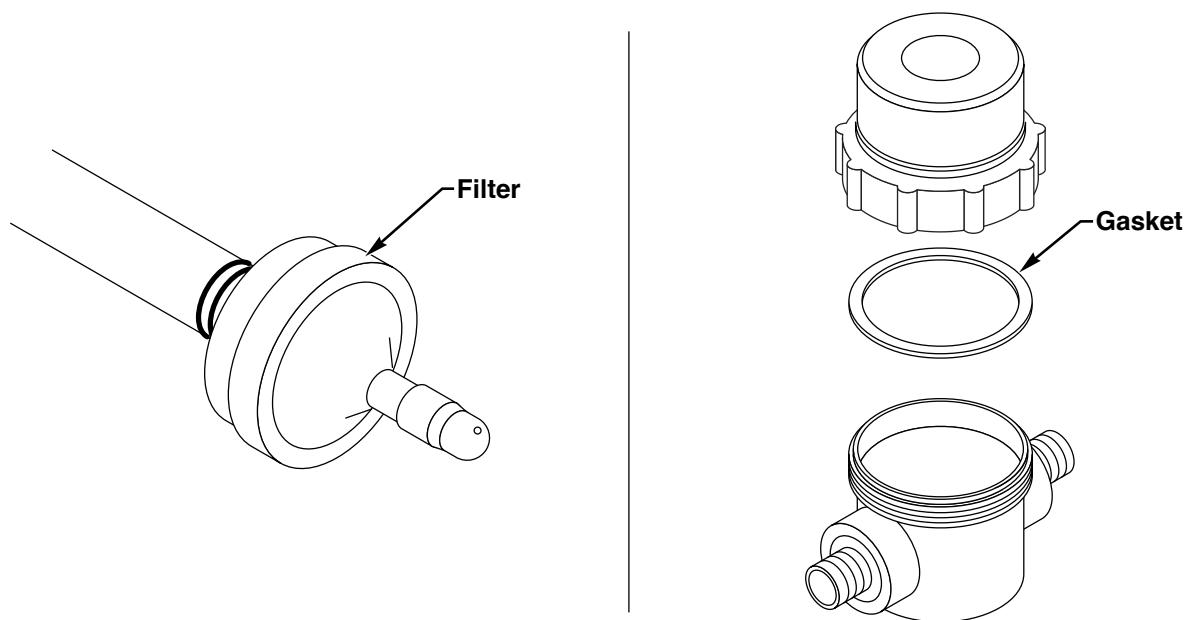


Figure 12- In-Line Gasoline Filter/Pulsation Damper

Engine

Lubricate and service the engine according to the engine manual. We recommend the use of a high quality, SAE 30W detergent oil classified "for service SF, SG, SH" (such as Briggs & Stratton(r) 100005 or 100028) when operating at temperatures above 40° F. Below 40°, SAE 10W30 or 5W30 oil is acceptable. Reference Figure 13.

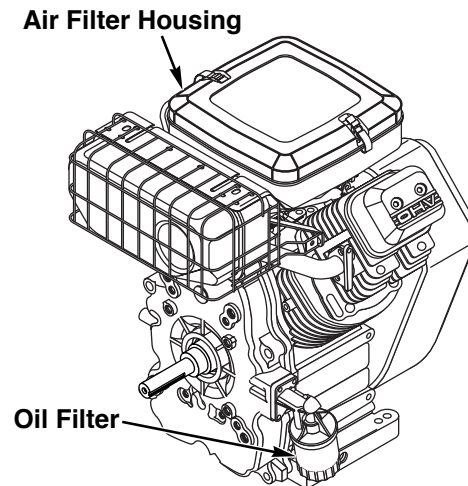


Figure 13- Engine Filters

Blower

A simple but very effective lubrication system is employed on the blower. At the drive shaft end the bearings are grease lubricated using hydraulic pressure relief fittings. These relief fittings vent any excess grease, preventing pressure build-up on the seals. A restriction plug and metering orifice prevent loss of lubricant from initial surges in lubricant pressure but permit venting excess lubricant under steadily rising pressures.

The blind end bearings and timing gears are enclosed by a gearhouse located opposite the drive end of the blower. The lower timing gear functions as an oil slinger, carrying lubricant to the upper timing gear and providing splash lubrication for the bearings. Pressure within the gearbox is vented through the breather plug.

To fill the gearbox, remove the breather plug and the oil overflow plug. Fill the reservoir up to the overflow hole. Place the breather and the overflow plug into their respective holes.

Under normal conditions the oil level on the non-drive end of the blower should be checked every 25 hours of operation. Change the oil every 100 hours or 30 days, whichever comes first. Under extremely hot or dusty operation conditions, the oil level should be checked more often and may

require more frequent changes. Every six months the oil breather plug should be removed cleaned in solvent and blown out with clean compressed air to provide unobstructed venting.

Shaft bearings at the drive end of the blower are grease lubricated and each bearing housing is equipped with pressure type grease fittings and pressure type relief fittings. When servicing drive end bearing, use a premium grade, petroleum base grease with high temperature and moisture resistance and good mechanical stability. Using a pressure gun, force new lubricant into each drive end bearing housing until traces of clean grease comes out of the relief fittings. Grease should be added using hand operated grease gun to the drive end bearings at varying time intervals depending on duty cycle. Reference Figure 14

Recommended greasing intervals:

1. With the blower operating 8 hours per day, grease should be added every two weeks.
2. With the blower operating 16 hours per day, grease should be added every week.

More frequent intervals may be necessary depending on the grease operating temperature and under unusual circumstances.

The oil used must be of the proper viscosity and certified to meet M-S type specifications of heavy-duty type. Do not use multiple viscosity oils.

Recommended oil viscosity:

- 30° F and under SAE 30
- From 30° F to 90° F SAE 40
- From 90° F SAE 50

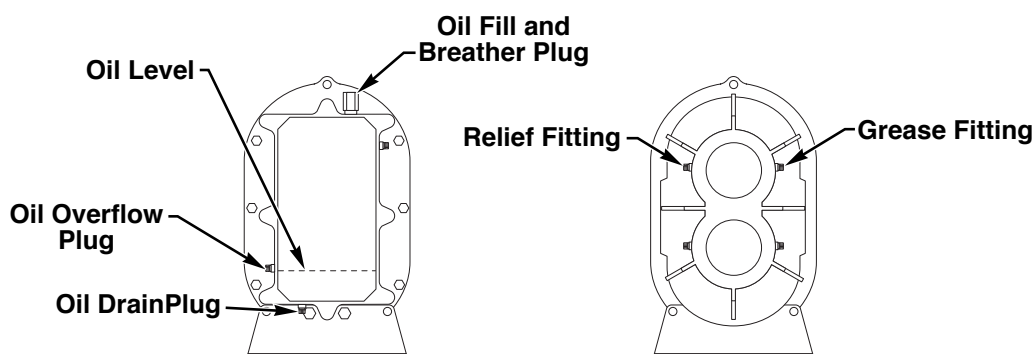


Figure 14- Blower

Couplings

To replace the engine, blower coupling, coupling sleeve or rubber sleeve:

1. Disconnect the negative(black) battery cable on the battery.
2. Remove the coupling guard cover. (4 screws, internal washers)
3. Remove the pressure gauge panel assembly (2 screws, internal washers) and set aside toward engine assembly.

Note: You do not need to disconnect hoses and wires on machine.

4. To remove coupling halves. Remove the 6 capscrews with washers (3 on the blower side, 3 on engine side). Then remove the 4 squarehead capscrews located on the bushings, inside the coupler halves.(2 on the blower side, 2 on engine side). Take 1 squaredhead capscrew and tighten in the center hole of both the blower and engine bushing. Break loose from the shaft. Reference Figure 15.

Note: If these couplings are hard to remove, the couplings are rusted to the shafts. Take some penetration oil such as Marvel Mystery oil and spray onto shafts to loosen the rust from shafts and bushings.

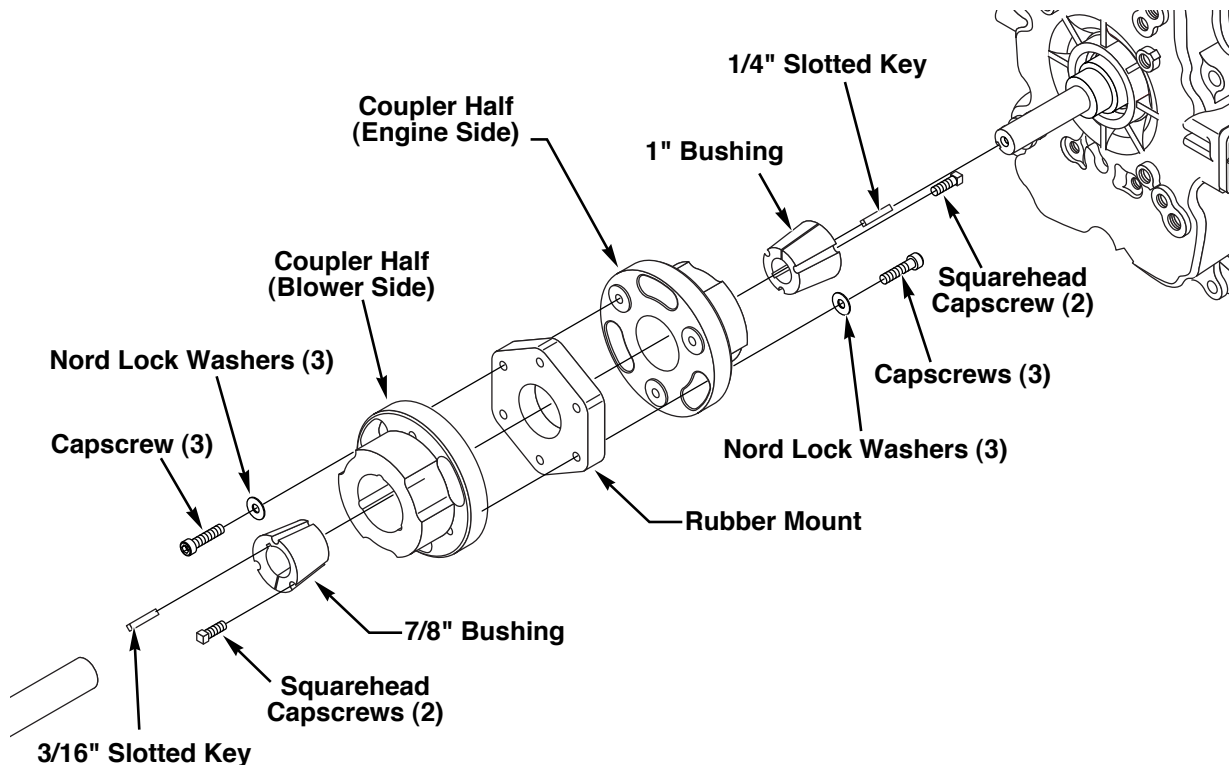


Figure 15- Coupling Assembly

5. Remove blower from the mainframe(4 nuts, bolts, lock washers). Carefully remove rust, dirt, burrs, etc. from both engine and blower shafts using a file or emery cloth.
6. Take the engine coupler halve and place a 1" bushing into the center of the coupler aligning the 3 open holes. Take 2 squarehead capscrews and screw finger tight into the two opposite holes across from each other on the bushing. Take 1/4" slotted key, install between bushing and slide coupler halve onto the engine shaft. Leave loose, go to step 7. Reference Figure 16.

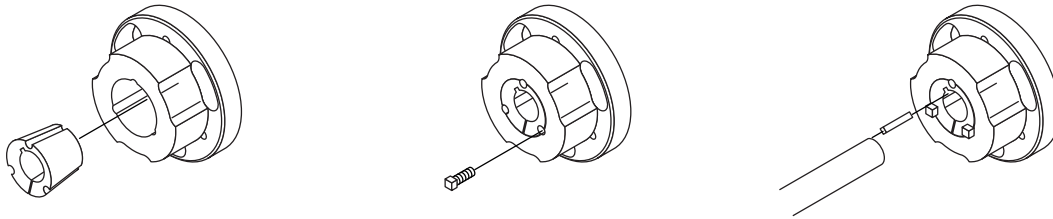


Figure 16- Bushing/Shaft Installation

7. Take the blower coupler halve and place a 7/8" bushing into the center of coupler aligning the 3 hole openings. Take 2 squarehead capscrews and screw finger tight into the two opposite holes across from each other on the bushing. Take 3/16" slotted key, install between bushing and slide coupler halve onto the blower shaft, make sure bushing and end of blower shaft are flush, then begin to tighten 2 squarehead capscrews on bushing and coupler turning equally onto the blower shaft. Torque to 14 ft. lbs. Take rubber mount and install 3 capscrews and washers to coupler half and tighten. Torque to 25 ft. lbs.
8. Install blower to main frame using 4 bolts, washers, lock washers, nuts, finger tight.
9. With both the engine and blower in place, slide engine coupler towards blower coupling and tighten equally together using 3 capscrews and washers. Torque to 25 ft. lbs. Take remaining 2 squarehead capscrews on engine bushing and coupler tighten equally. Torque to 14 ft. lbs.
10. Check parallel alignment by placing a straight edge across the two coupling flanges and measure the maximum offset at various points around the edge of the coupling flanges without rotating the coupler flanges. if the maximum offset exceeds XX inches, realign the shafts.

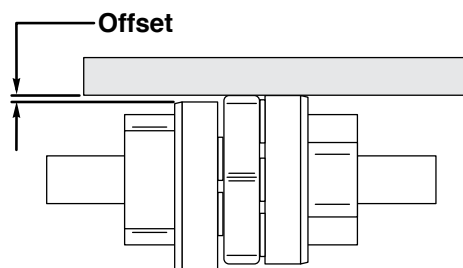


Figure 17- Parallel Alignment

11. Check angular alignment with micrometer, vernier, or caliper. Measure from the outside of the one flange to outside of the other at intervals around the edge of the coupling flanges. Determine the maximum and minimum dimensions without rotating the flange couplings. These measurements must center coupling assembly within blower and engine. If correction is necessary, be sure to recheck the parallel alignment.

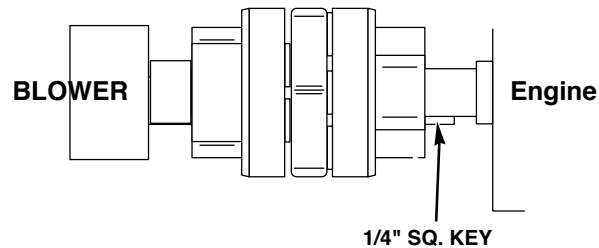


Figure 18- Angular Alignment

12. Tighten 4 nuts on blower to main frame after alignment is completed. Recheck angular and parallel alignment.
13. Install pressure gauge panel assembly. (2 screws, internal washers)
14. Install the coupling guard cover. (4 screws, internal washers)
15. Connect the negative battery cable.

Note: The coupling, coupling rubber mount and connected equipment will normally operate longer and more economically when the couplings are carefully aligned.

CAUTION

Coupling sleeve may be thrown from the coupling assembly with substantial force when the couplings are subjected to a severe shock load or abuse.

Storage

Before storing the CLARKE Grizzly Cold Aerosol Fog Generator after use or if it is to be idle for any appreciable length of time, the following preparations should be made:

1. Flush the fog generator for at least 10 minutes.
2. Drain the insecticide tank and thoroughly clean it.
3. Drain the flush tank and thoroughly clean it.
4. Pour 1 quart of light weight oil into the flush tank. Engine oil can be used.
5. Pour enough light weight oil into the insecticide tank to cover the bottom of the drop pipe.
6. Spray and flush the fog generator until the oil in the insecticide and flush tanks is completely through the system and sprays out of the nozzle.
7. Engine:
 - a. All fuel should be removed from the tank. Run the engine until it stops from lack of fuel.
 - b. While the engine is still warm, drain the oil from the crankcase. Refill with fresh oil.
 - c. Remove the spark plugs and add a tablespoon of engine oil into the spark plug holes. Install the spark plugs, but do not connect the plug leads. Crank the engine slowly 2 to 3 revolutions to distribute the oil. Replace the plug leads.
 - d. Clean dirt and chaff from the cylinders, cylinder head fins, engine blower housing, rotating screen and muffler areas.
 - e. Clean all other exterior surfaces of the engine.
 - f. Spread a light film of oil over any exposed metal surfaces of the engine to prevent rust.
8. Remove and clean the filter-silencer element and housing as explained in Maintenance (page 43) section. Reference Figure 10.

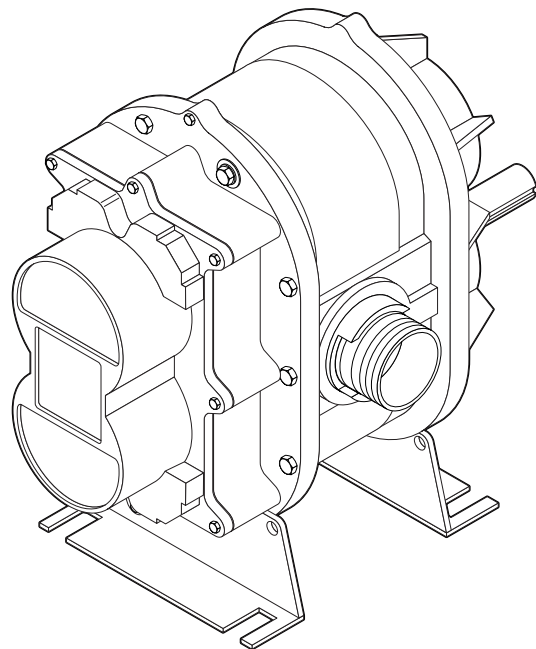
MAINTENANCE

GRIZZLY® ULV SPRAYER

9. Blower:
 - a. Remove the oil breather plug, clean in solvent and blow out with clean compressed air.
 - b. Drain the oil from the oil reservoir and refill with fresh oil. Grease the bearings on the drive end.
 - c. Remove the filter-silencer. If the filter-silencer is hard to unscrew from the blower inlet port, use penetrating oil such as Marvel Mystery Oil(r) to loosen the rusted threads.
 - d. Pour 1 pint of lubrication oil (SAE 40) in the blower intake.
 - e. With the engine ignition switch off, use the starter to turn the blower slowly so that the entire inner surface of the blower is coated with oil. This will prevent a coat of rust from forming in the blower and in all probability will save the cost of a new blower or an expensive repair bill.
 - f. Reinstall the filter-silencer.
10. Charge the battery and store as recommended by the manufacturer.
11. Clean all insecticide residue and oil off the CLARKE Cougar Cold Aerosol Fog Generator and repaint if necessary.
12. Store the CLARKE Cougar Cold Aerosol Fog Generator in a clean dry area under suitable cover protected from the elements.

A major problem can be the blower rusting up over the winter. If moisture gets into air chamber, the rotary lobes will rust together preventing the blower from turning. When this happens, either the engine or blower shaft may be sheared when the engine is started. Following the storage recommendations of this manual can prevent this.

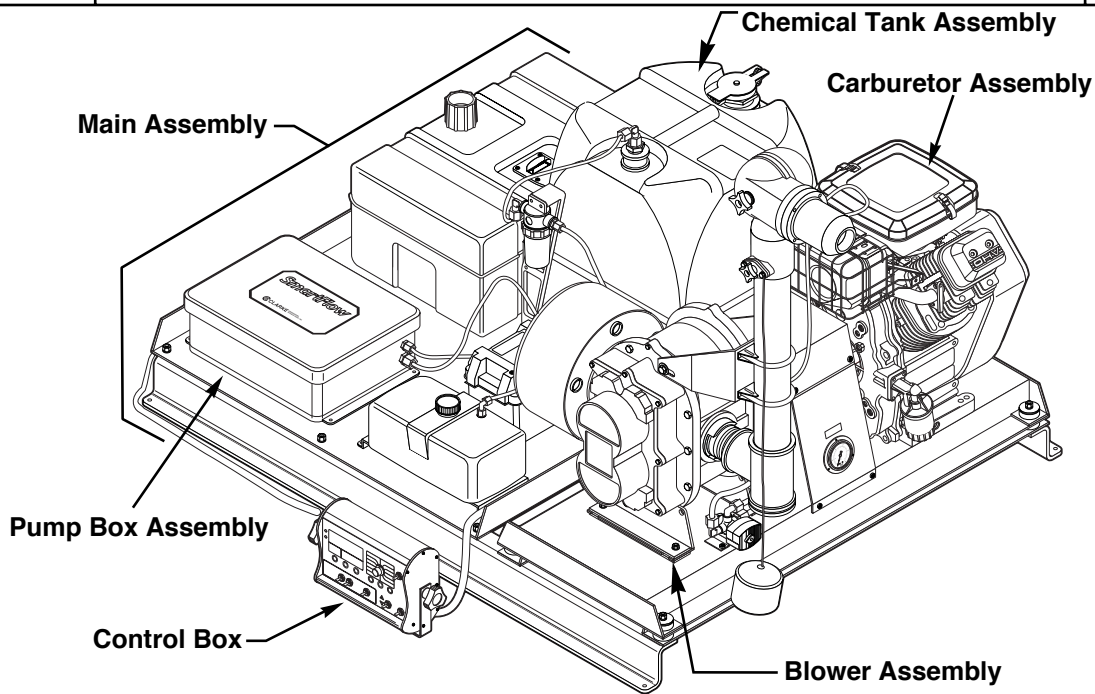
Removing the port elbows and pouring penetration oil such as Marvel Mystery Oil[®] into the lobe chamber will usually loosen a rusted blower. The blower may need to sit for a day or two with the penetration oil in it before the engine is started. When trying to free the blower, don't turn the ignition switch on. Just bump the starter button until the blower turns. In extreme cases, the blower shaft may have to be turned by hand with the pipe wrench to loosen the lobes. Care must be taken not to damage the blower shaft with the pipe wrench. Once the blower turns, the engine can be started and the lobes should hone themselves free of rust.



PARTS BOOK - TABLE OF CONTENTS

GRIZZLY® ULV SPRAYER

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55 - 58	ENGINE ASSEMBLY (No Part Brardown).....	12788
55 - 58	FLUSH TANK ASSEMBLY.....	10210
59 - 62	BLOWER ASSEMBLY	12757
59 - 60	FLUSH SOLENOID ASSEMBLY.....	12822
59 - 60	SWIVEL ASSEMBLY	10312
63 - 64	NOZZLE ASSEMBLY.....	10314.2
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69 - 70	GAUGE PANEL ASSEMBLY	12809
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71	ENGINE PANEL ASSEMBLY	12637
72	CHOKE ASSEMBLY	12762



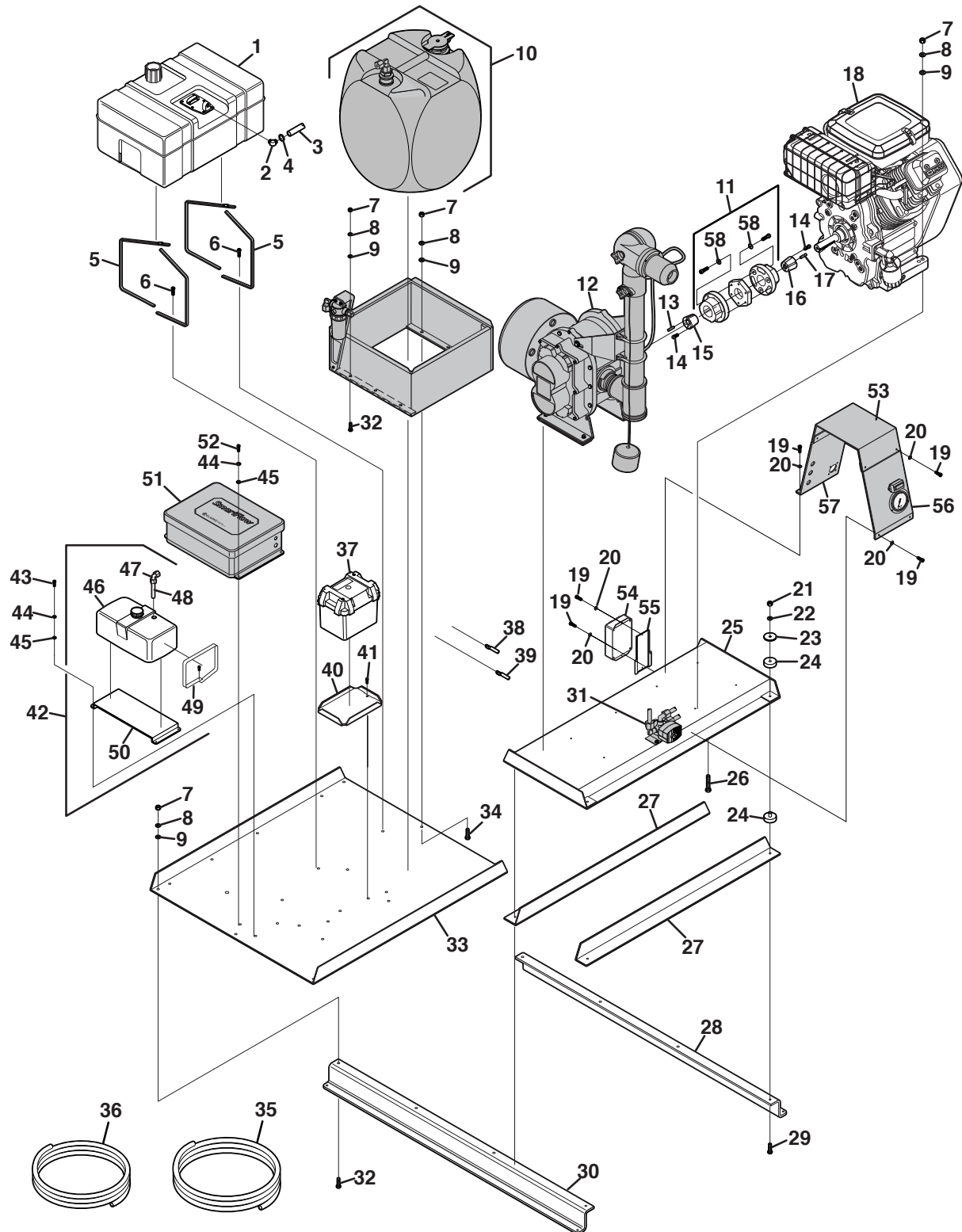
Procedure for determining correct part number and description of individual parts:

1. Refer to the component breakdown illustrations on page 56 and the parts list on page 57.
2. If the individual part is shown on the illustration, the part number and the description can be obtained from the parts list.
3. If the part is a component of an assembly, the location of the assembly breakdown can be obtained from the parts list. This assembly breakdown will identify the individual part.

NOTE: If there is a reference to serial numbers please take this into consideration.

MAIN ASSEMBLY

GRIZZLY® ULV SPRAYER



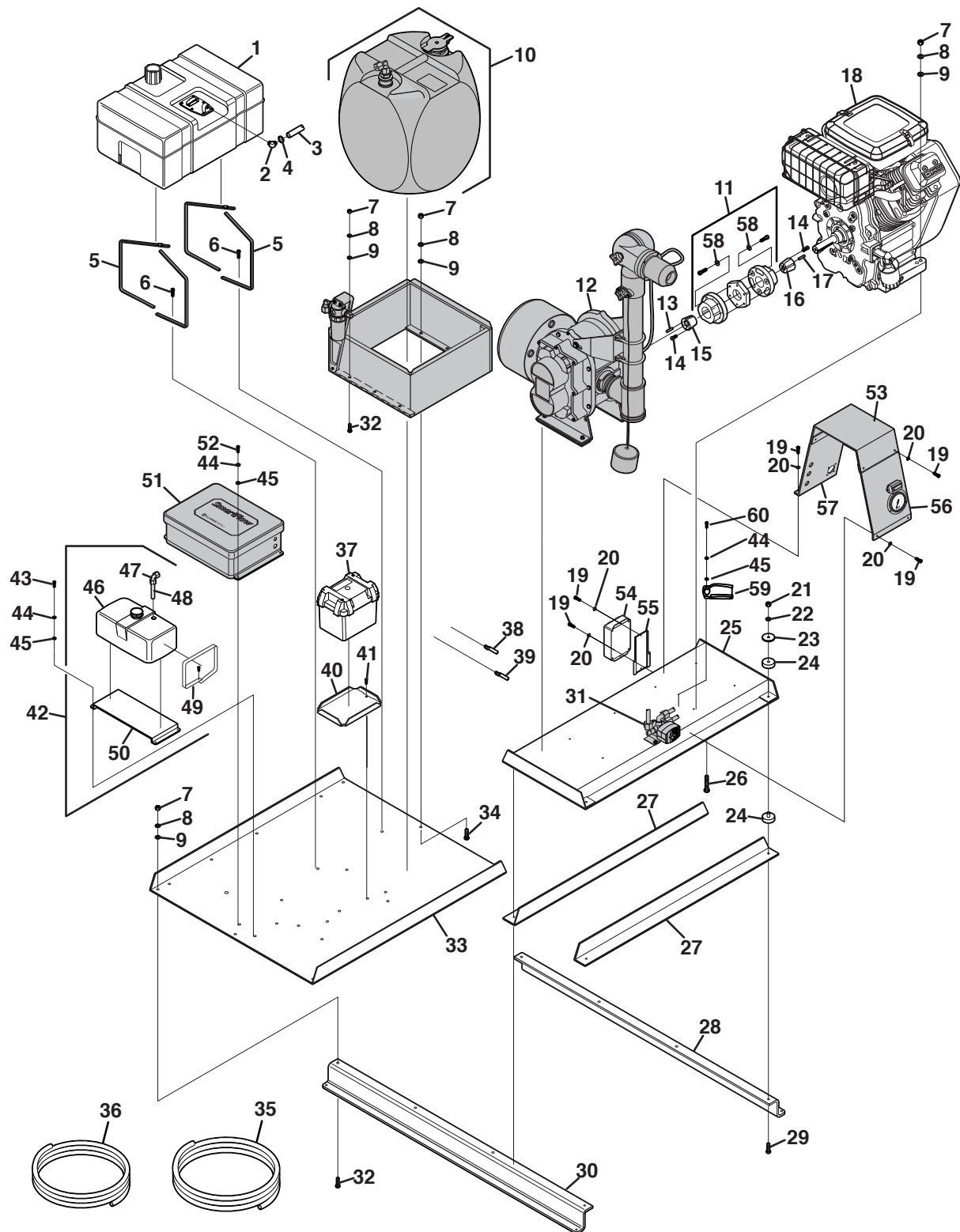
MAIN ASSEMBLY

GRIZZLY® ULV SPRAYER

Pos	Qty.	Description	Part No.
1	1	GAS TANK 12 GALLONS	10209
2	1	1/4" X 1/4" 90° MALE ELBOW HOSE BARB	10328
3	50"	1/4" GAS LINE	10045
4	2	HOSE CLAMP	10033
5	2	STRAP ASSEMBLY (FEMALE)	10340.1
		STRAP ASSEMBLY (MALE)	10340.2
6	4	10 - 32 X 1/4" PHILLIPS PAN HEAD SCREW	11144Z
7	12	5/16" - 24 HEX NUT	11260
8	12	5/16" SPLIT LOCK WASHER	11241
9	12	5/16" SAE FLAT WASHER	11240
10	1	CHEMICAL TANK ASSEMBLY(See "CHEMICAL TANK ASSEMBLY" on page 67)	10296
11	1	COUPLER ASSEMBLY	13245
12	1	BLOWER ASSEMBLY(See "BLOWER ASSEMBLY" on page 61)	12757
13	1	3/16" SLOTTED KEY	13234
14	4	SQUARE CAPSCREWS	11315
15	1	7/8 BUSHING	13243
16	1	1" BUSHING	13244
17	1	1/4" SLOTTED KEY	13233
18	1	ENGINE ASSEMBLY	12788
19	12	10 - 32 X 3/8" PHILLIPS PAN HEAD SCREW	11145Z
20	12	#10 INTERNAL LOCK WASHER	11102Z
21	4	3/8" - 24 HEX NUT	11320Z
22	4	3/8" SPLIT LOCK WASHER	11291
23	4	WASHER, RUBBER MOUNT	10223
24	4	RUBBER MOUNT	10222
25	1	MAIN FRAME	12794
26	4	5/16 - 24 X 2" BOLT	11268
27	2	STIFFENER ANGLE	10146
28	1	BASE RAIL, ENGINE END	10195
29	4	3/8" - 24 X 2 1/4" BOLT	11324
30	1	BASE RAIL, BLOWER END	10196
31	1	SOLENOID ASSEMBLY (See "BLOWER ASSEMBLY" on page 58)	12822
32	6	5/16" - 24 X 3/4" BOLT	11263
33	1	BASE PLATE	10140
34	2	5/16" - 24 X 1" BOLT	11264
35	AR	3/8" POLY TUBE - ORDER BY THE INCH	10041
36	AR	1/4" POLY TUBE - ORDER BY THE INCH	10040
37	1	BATTERY BOX	10007
38	1	POSITIVE BATTERY CABLE	12645
39	1	NEGATIVE BATTERY CABLE	12769
40	1	BATTERY PLATE	10017
41	2	1/4" - 20 X 3/8" PHILLIPS PAN HEAD SCREW	11201
42	1	FLUSH TANK ASSEMBLY INCLUDES ITEMS 46-50	10210
43	4	1/4" - 20 X 1/2" PHILLIPS PAN HEAD SCREW	11184
44	9	1/4" SPLIT LOCK WASHER	11171
45	9	1/4" SAE FLAT WASHER	11170Z
46	1	FLUSH TANK W/CAP 12011	10211
47	1	3/8" X 1/4" X 90° FEMALE ELBOW INCLUDES 3/8" NUT #10539	10204

MAIN ASSEMBLY

GRIZZLY® ULV SPRAYER



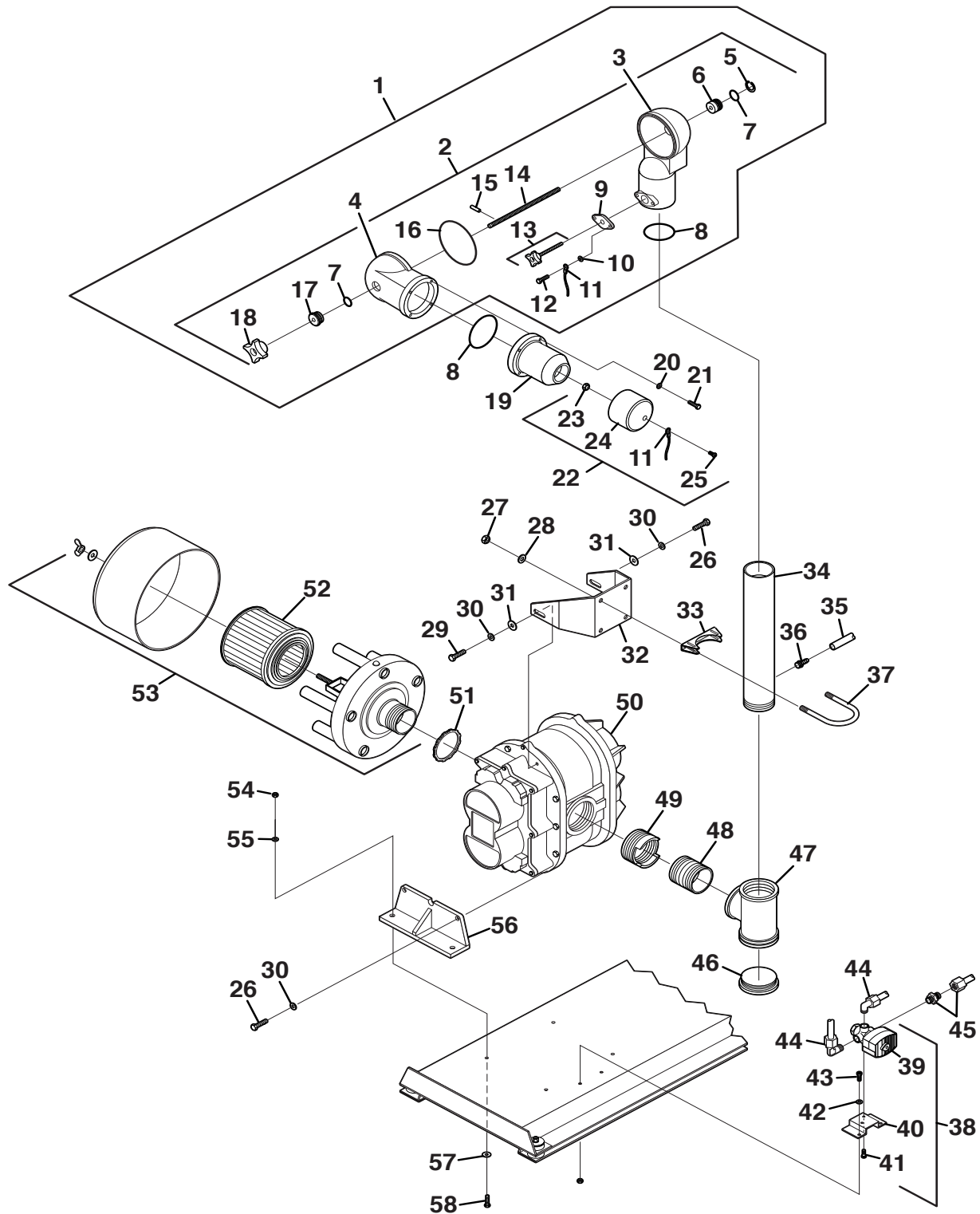
MAIN ASSEMBLY

GRIZZLY® ULV SPRAYER

Pos	Qty.	Description	Part No.
48	1	PICK-UP TUBE	10336
49	2	STRAP ASSEMBLY	10321
50	1	MOUNTING BRACKET, FLUSH TANK	10086
51	1	FLOW CONTROL ASSEMBLY(SEE "PUMP BOX ASSEMBLY" on page 69).....	12969
52	4	1/4" - 20 X 5/8" PHILLIPS PAN HEAD SCREW.....	11187
53	1	COVER.....	12784
54	1	E.P.C. MODULE.....	12609.1
55	1	BRACKET FOR E.P.C. MODULE.....	13036
56	1	GAUGE PANEL ASSEMBLY (SEE "GAUGE PANEL ASSEMBLY" on page 70)	12809
57	1	CONNECTION PANEL ASSEMBLY (SEE "GAUGE PANEL ASSEMBLY" on page 70).....	12773
58	6	10MM NORD LOCK WASHERS.....	13404
59	1	CLAMP	13163
60	1	1/4" - 20 X 3/4 PHILLIPS PAN HEAD SCREW	11189

BLOWER ASSEMBLY

GRIZZLY® ULV SPRAYER



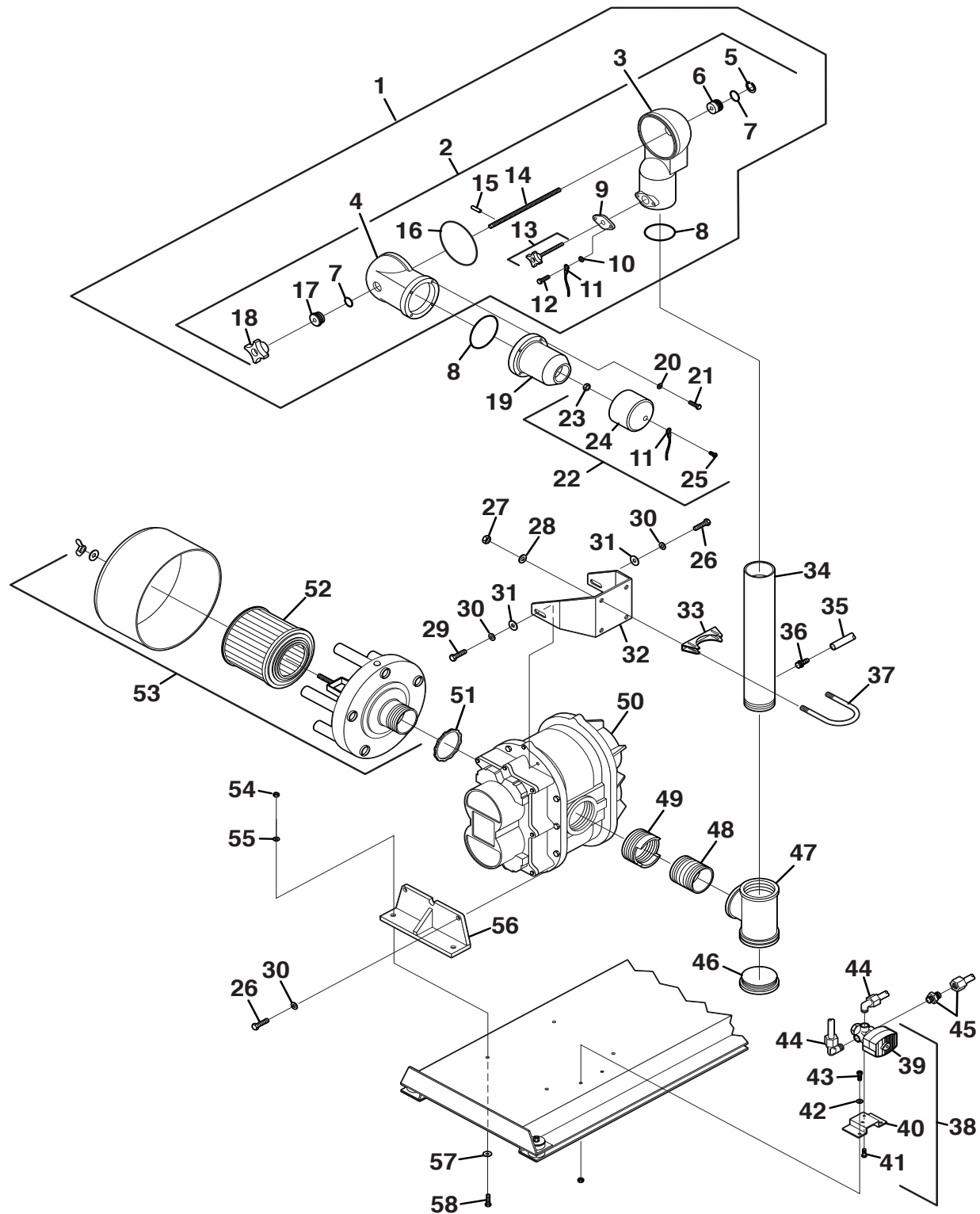
BLOWER ASSEMBLY

GRIZZLY® ULV SPRAYER

Pos	Qty.	Description	Part No.
1	1	SWIVEL ASSEMBLY	10312
2	1	STUD KNOB ASSEMBLY	10402.1
3	1	SWIVEL HALF INLET	10173
4	1	SWIVEL HALF OUTLET	10269
5	1	SNAP RING STAINLESS STEEL	10293
6	1	PLUG 3/8" - 24	10183.1
7	2	O-RING	10167
8	2	O-RING	10185
9	1	RETAINER PLATE	10292
10	2	INTERNAL LOCK WASHER 1/4"	11172
11	1	CABLE ASSEMBLY	10487
12	2	PHILLIPS PAN HEAD 1/4" - 20 X 3/4"	11189
13	1	STUD KNOB ASSEMBLY	10267
14	1	STUD ASSEMBLY INCLUDES #9 SPRING PIN	10268.1
15	1	SPRING PIN 1/8" X 1/2"	11001Z
16	1	O-RING	10184
17	1	PLUG FLANGE	10182
18	1	KNOB 3/8" - 24	12056
19	1	NOZZLE ASSEMBLY (See "NOZZLE ASSEMBLY" on page 64)	10314.2
20	4	HIGH COLLAR LOCKWASHER #10	11103Z
21	4	SOCKET CAP SCREW 10 - 24 X 3/4"	11117
22	1	RAIN CAP ASSEMBLY INCLUDES 11,23,24,25	10494
23	1	FLEX LOCKNUT 10 - 24	11111Z
24	1	RAIN CAP	10488
25	1	PHIL PAN HEAD SCREW 10 - 24 X 1/2"	11113Z
26	5	BOLT 3/8" - 16 X 1-1/4"	11304
27	4	NUT 5/16" - 18	11250
28	4	LOCKWASHER 5/16	11241
29	1	BOLT 3/8" - 16 X 1"	11303
30	6	LOCKWASHER 3/8"	11291
31	2	WASHER 3/8"	11290
32	1	MAST BRACE	10285
33	2	CLAMP	10284A
34	1	MAST	10194.1
35	25"	AIRLINE 1/4"	10042
36	1	HOSE BARB W/ ORIFICE 1/4" X 1/4"	10588
37	2	U-BOLT	10284
38	1	SOLENOID ASSEMBLY INCLUDES 39, 40, 41	12822
39	1	SOLENOID VALVE 3/WAY	10709
40	1	BRACKET	10580
41	2	PHILLIPS PAN HEAD THREAD FORMING 8 - 32 X 1/4"	11090
42	2	LOCK WASHER 1/4"	11171
43	2	PHILLIPS PAN HEAD 1/4" - 20 X 3/8"	11201
44	2	MALE JACO ELBOW 3/8" X 1/4" X 90 COMES WITH NUT #10539	10181
45	1	MALE JACO 3/8" X 1/4" COMES WITH NUT #10539	10834
46	1	PIPE PLUG	12013
47	1	TEE 2"	10288
48	1	NIPPLE 2" X CLOSE	10289

BLOWER ASSEMBLY

GRIZZLY® ULV SPRAYER



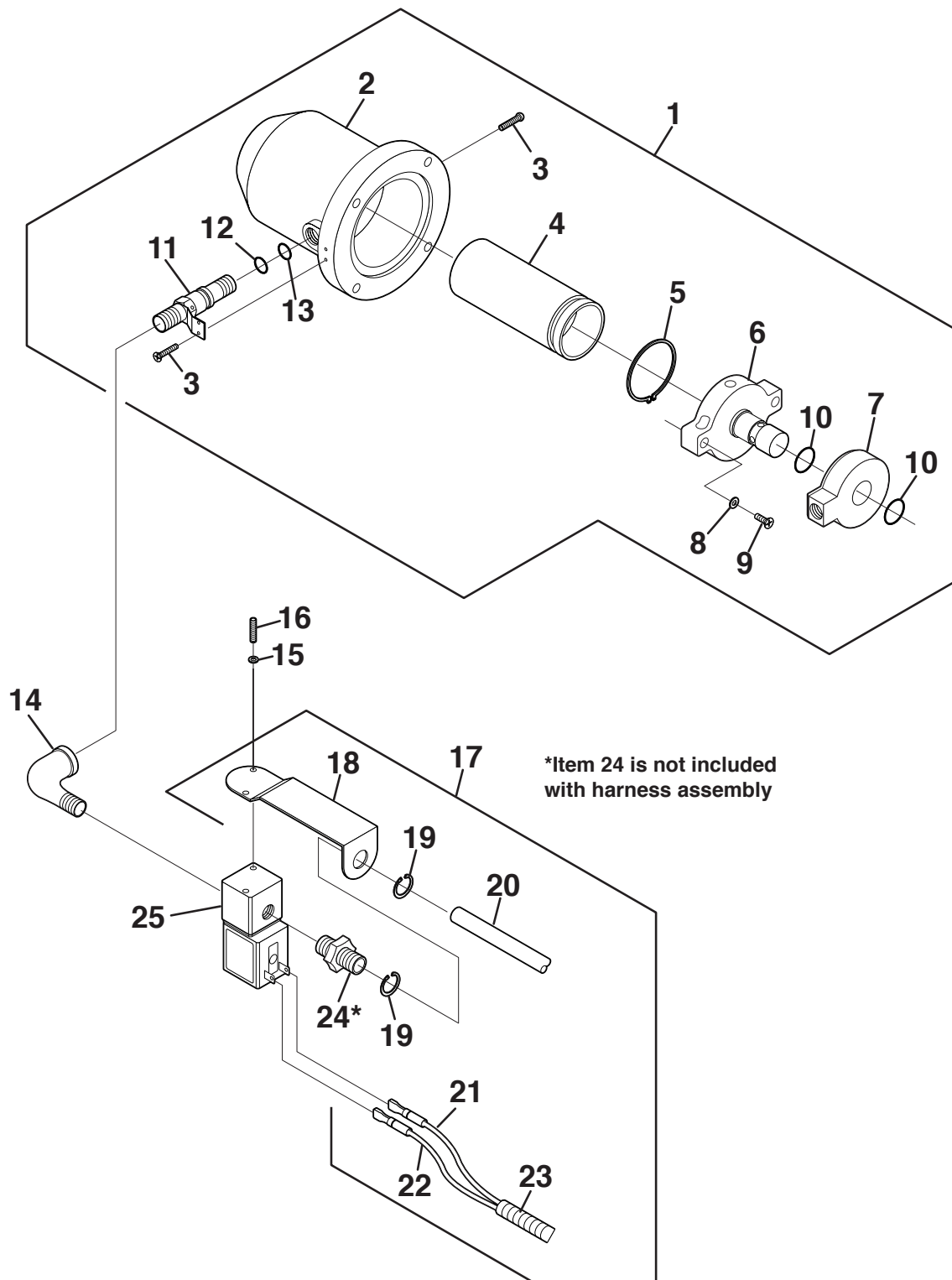
BLOWER ASSEMBLY

GRIZZLY® ULV SPRAYER

Pos	Qty.	Description	Part No.
49	1	BUSHING 2 1/2" X 2"	10733
50	1	BLOWER.....	10208
51	1	LOCKNUT 2 1/2".....	10200
52	1	AIR FILTER.....	12021
53	1	AIRCLEANER ASSEMBLY INCLUDES 52.....	10114
54	4	NUT 3/8" - 24	11320
55	4	LOCK WASHER 3/8"	11291
56	2	FOOT	12802
57	4	WASHER SPL.....	13222
58	4	BOLT 3/8" - 24 X 1-1/4".....	11321

NOZZLE ASSEMBLY

GRIZZLY® ULV SPRAYER



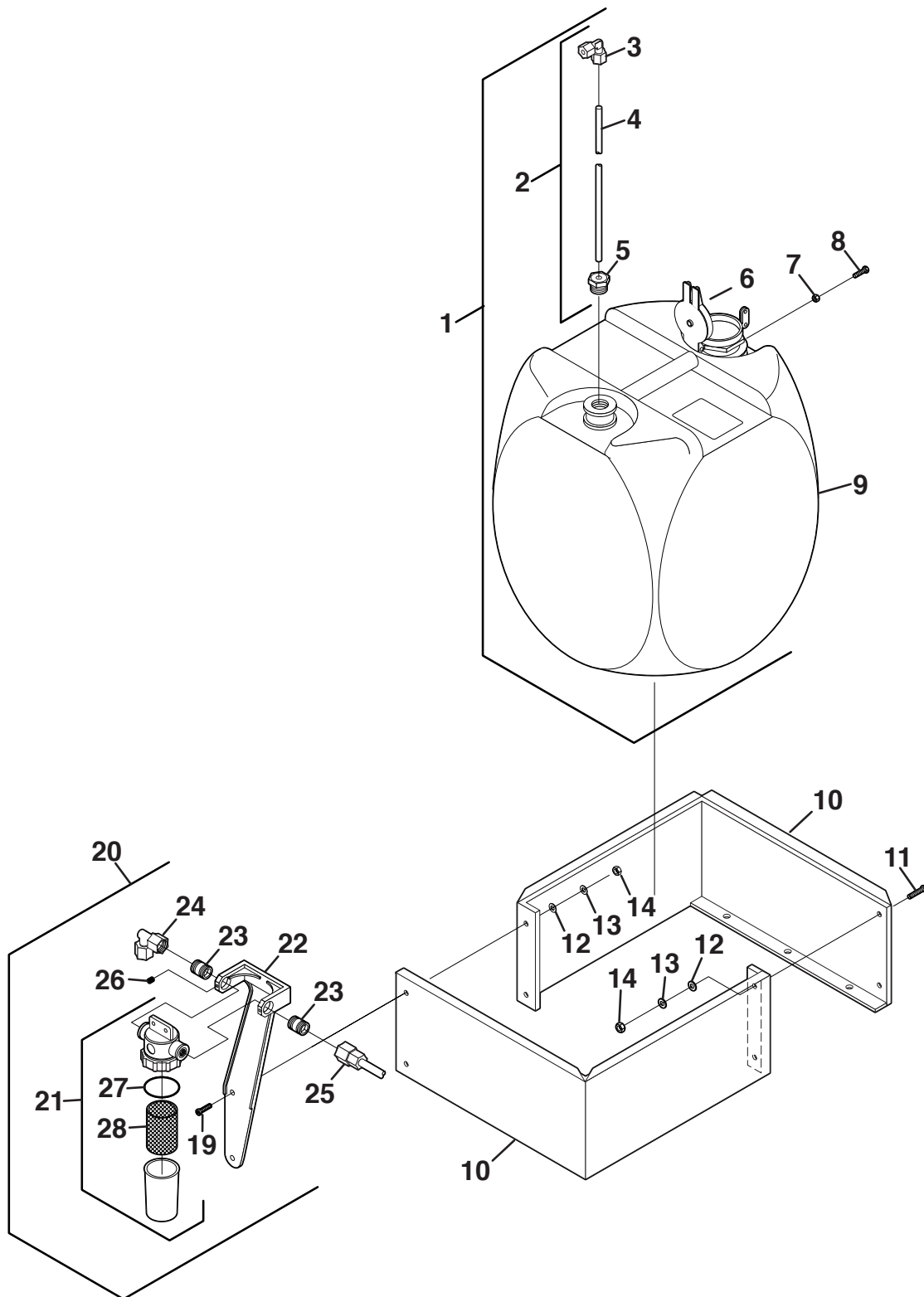
NOZZLE ASSEMBLY

GRIZZLY® ULV SPRAYER

Pos	Qty.	Description	Part No.
1	1	NOZZLE ASSEMBLY INCLUDES ITEMS 2-13	10314.2
2	1	NOZZLE BODY	10271
3	3	PHILLIPS PAN HEAD SCREW 10 - 32 X 3/8"	11145Z
4	1	DIFFUSER CONE	10272
5	1	SNAP RING S.S.	10788
6	1	FLUID CORE, AIR ELEMENT ASSEMBLY	12038
7	1	FLUID TEE	12454
8	2	HI COLLAR LOCK WASHER #10.....	11103
9	2	SOCKET CAP SCREW 10 - 24 X 3/4"	11117
10	2	O-RING	10247
11	1	INJECTION NIPPLE.....	12532
12	1	O-RING	10166
13	1	O-RING	12452
14	1	1/8" STREET ELBOW, 90° S.S	12478
15	2	LOCK WASHER #4.....	H1210
16	2	PHILLIPS PAN HEAD 3mm- 5x7mm	13571
17	1	HARNESS ASSEMBLY INCLUDES ITEMS 18-23	12610
18	1	HARNESS BRACKET	10021
19	2	SNAP RING.....	10322
20	67"	POLY TUBE	10040
21	1	WIRE ASSEMBLY (WHITE).....	12521
22	1	WIRE ASSEMBLY (BLACK)	12520
23	39"	LOOM.....	10046
24	1	1/4" X 1/8" MALE FITTING INCLUDES 1/4" NUT #10538.....	10037
25	1	SOLENOID VALVE	10101

CHEMICAL TANK ASSEMBLY

GRIZZLY® ULV SPRAYER



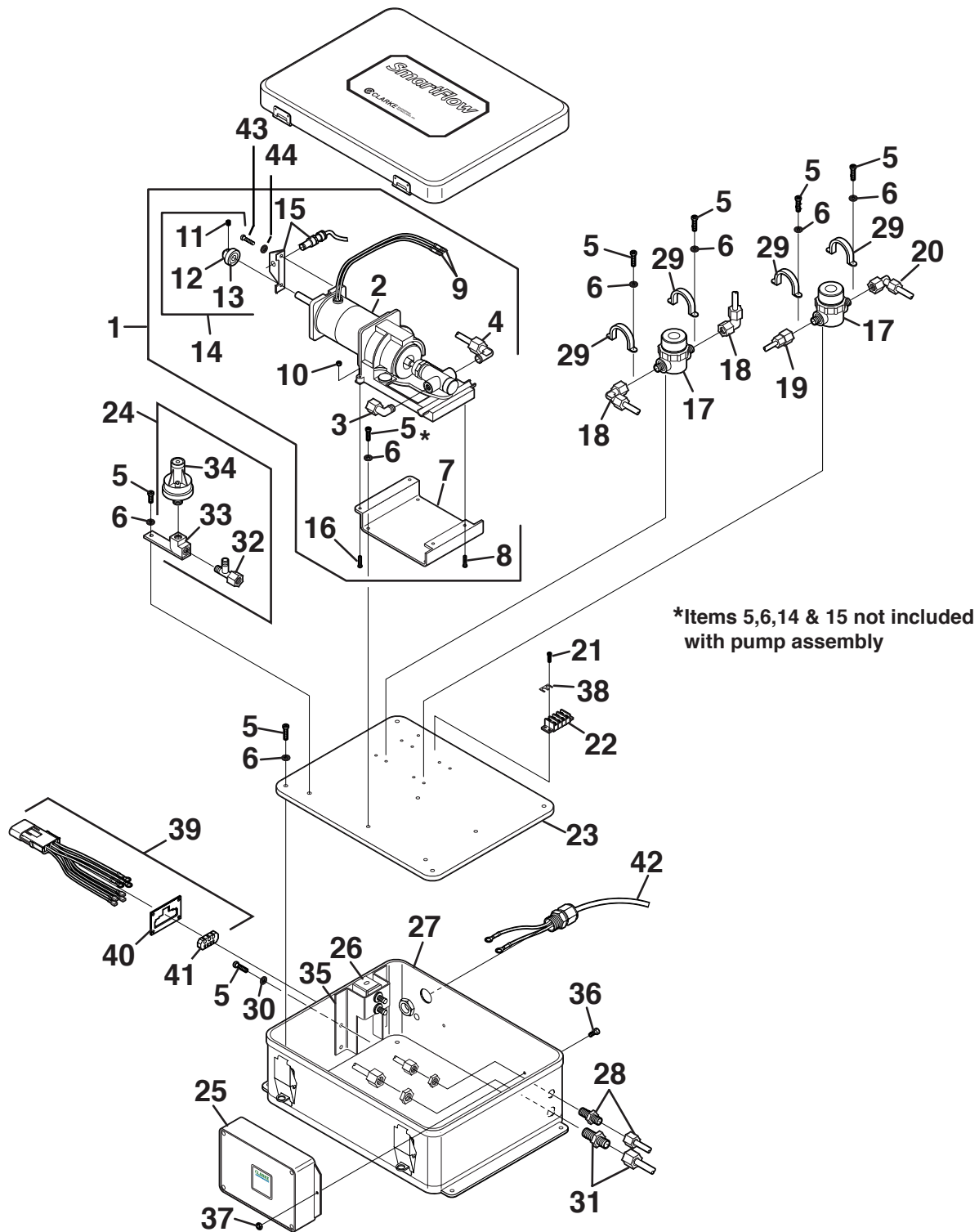
CHEMICAL TANK ASSEMBLY

GRIZZLY® ULV SPRAYER

Pos	Qty.	Description	Part No.
1	1	CHEMICAL TANK ASSEMBLY	10296
2	1	PICK UP TUBE ASSEMBLY	10298
3	1	3/8" X 1/4" 90° FEMALE ELBOW INCLUDES 3/8" NUT #10539	10204
4	1	PICK UP TUBE WELDMENT	12050
5	1	3/4" X 1/4" NYLON BUSHING DRILLED	10039.1
6	1	TANK CAP ASSEMBLY	10118
7	1	6 - 32 NYLON INSERT LOCK NUT, S.S.	11063
8	1	6 - 32 X 5/8" PHILLIPS PAN HEAD SCREW, S.S.	11058Z
9	1	CHEMICAL TANK	10011
10	2	TANK WRAP	10020
11	2	1/4" - 20 X 3/4" PHILLIPS PAN HEAD SCREW	11189
12	4	1/4" SAE FLAT WASHER	11170
13	4	1/4" SPLIT LOCK WASHER	11171
14	4	1/4"-20 HEX NUT	11180
19	2	1/4" - 20 X 1 1/4" PHILLIPS PAN HEAD SCREW	11197
20	1	FILTER ASSEMBLY INCLUDES ITEMS 21-26	12829
21	1	STAINER ASSEMBLY INCLUDES ITEMS 27,28	10155
22	1	CASTING, FILTER SUPPORT	12758
23	2	NIPPLE, 3/8 X 1 1/2 STAINLESS STEEL	12843
24	1	3/8 X 3/8 X 90 FEMALE JACO ELBOW	10838
25	1	FEMALE JACO 3/8 X 3/8	10836
26	2	SET SCREW 10-24 X 1/4	11133
27	1	GASKET	10388
28	1	STRAINER	10390

PUMP BOX ASSEMBLY

GRIZZLY® ULV SPRAYER



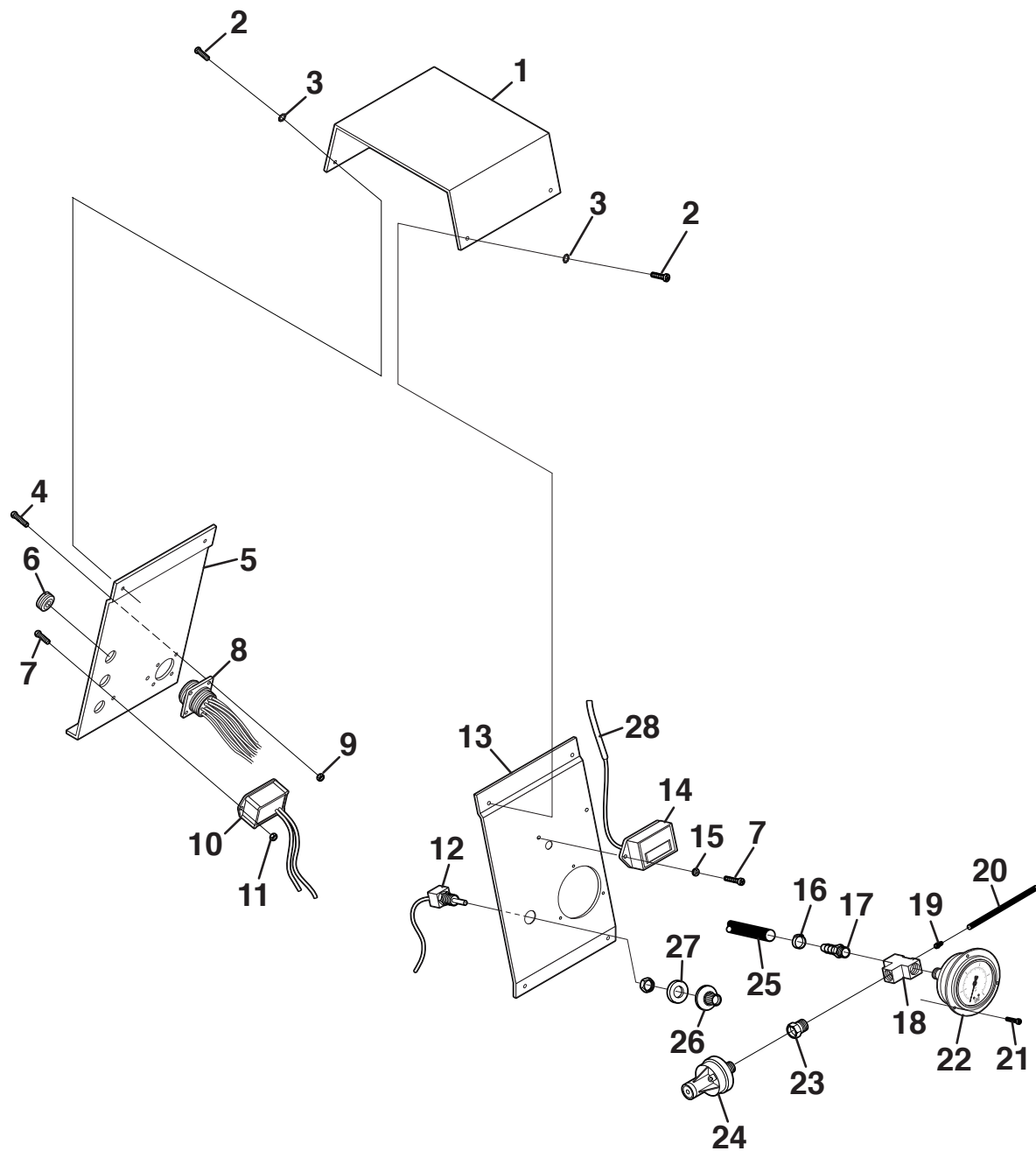
PUMP BOX ASSEMBLY

GRIZZLY® ULV SPRAYER

Pos	Qty.	Description	Part No.
1	1	PUMP ASSEMBLY.....	10344
2	1	PUMP.....	10177
3	1	1/4" X 1/4" X 90° MALE ELBOW INCLUDES 1/4" NUT #10538.....	10038
4	1	3/8" X 1/4" X 90° MALE ELBOW INCLUDES 3/8" NUT #10539.....	10181
5	21	10 - 32 X 3/8" PHILLIPS PAN HEAD SCREW.....	11145Z
6	17	#10 SPLIT LOCK WASHER.....	11101Z
7	1	PUMP PEDISTAL.....	10248
8	2	8 X 3/8" PHILLIPS PAN HEAD TAPPING SCREW.....	11075
9	2	#6 SPADE TERMINALS.....	30553
10	2	8 - 32 NYLON INSERT LOCK.....	11077
11	1	SET SCREW 8-32 X 1/4".....	11072
12	1	HUB MAGNET RING.....	12946
13	1	MAGNET RING.....	12947
14	1	MAGNET HUB ASSEMBLY INCLUDES ITEMS 11-13.....	12948
15	1	BRACKET AND SENSOR ASSEMBLY.....	12970
16	2	8 - 32 X 7/8" PHILLIPS PAN HEAD SCREW.....	11081Z
17	2	PULSATION DAMPER.....	10148
	2	• GASKET, PULSATION DAMPER INCLUDED WITH ITEM #17.....	10387
18	2	3/8" X 1/4" X 90° FEMALE ELBOW INCLUDES 3/8" NUT #10539.....	10204
19	1	1/4" X 1/4" FEMALE FITTING INCLUDES 1/4" NUT #10538.....	10128
20	1	1/4" X 1/4" FEMALE ELBOW INCLUDES 1/4" NUT #10538.....	10127
21	2	6 - 32 X 3/8" PHILLIPS PAN HEAD SCREW.....	11056
22	1	TERMINAL STRIP.....	10158
23	1	PANEL.....	12957
24	1	PRESSURE SWITCH ASSEMBLE.....	10439
25	1	EPD.....	12988
26	1	CIRCUIT BREAKER (15 Amp).....	12931
27	1	PUMP BOX DRILLED.....	12958
28	1	1/4" BULKHEAD UNION FITTING INCLUDES 1/4" NUT #10538.....	10179
29	4	CLAMP PULSATION DAMPNER MOUNT.....	12965
30	4	WASHER INTERNAL #10.....	11102Z
31	1	3/8" BULKHEAD UNION FITTING INCLUDES 3/8" NUT #10539.....	10180
32	1	JACO "TEE", INCLUDES 1/4" NUT #10538.....	10435
33	1	BRASS ELBOW W/ MOUNTING PLATE.....	10420
34	1	PRESSURE SWITCH - 50 psi.....	10417
35	1	BRACKET FOR CIRCUIT BREAKER.....	12967
36	2	SCREW 10-32 X 1/2" PHILLIPS PAN HEAD.....	11147
37	2	NUT 10-32 GEER JAM NYLOCK.....	11160
38	1	JUMPER.....	37211
39	1	HARNESS ASSEMBLY.....	12991
40	1	PANEL CONNECTION.....	12954
41	1	RETAINER, 7 PIN.....	12904
42	1	CABLE ASSEMBLY (PUMP BOX).....	12956
43	2	Screw 8- 32x 3/8" Phillips Pan Head.....	11078
44	2	#8 Internal Lock Washer.....	11085

GAUGE PANEL ASSEMBLY

GRIZZLY® ULV SPRAYER



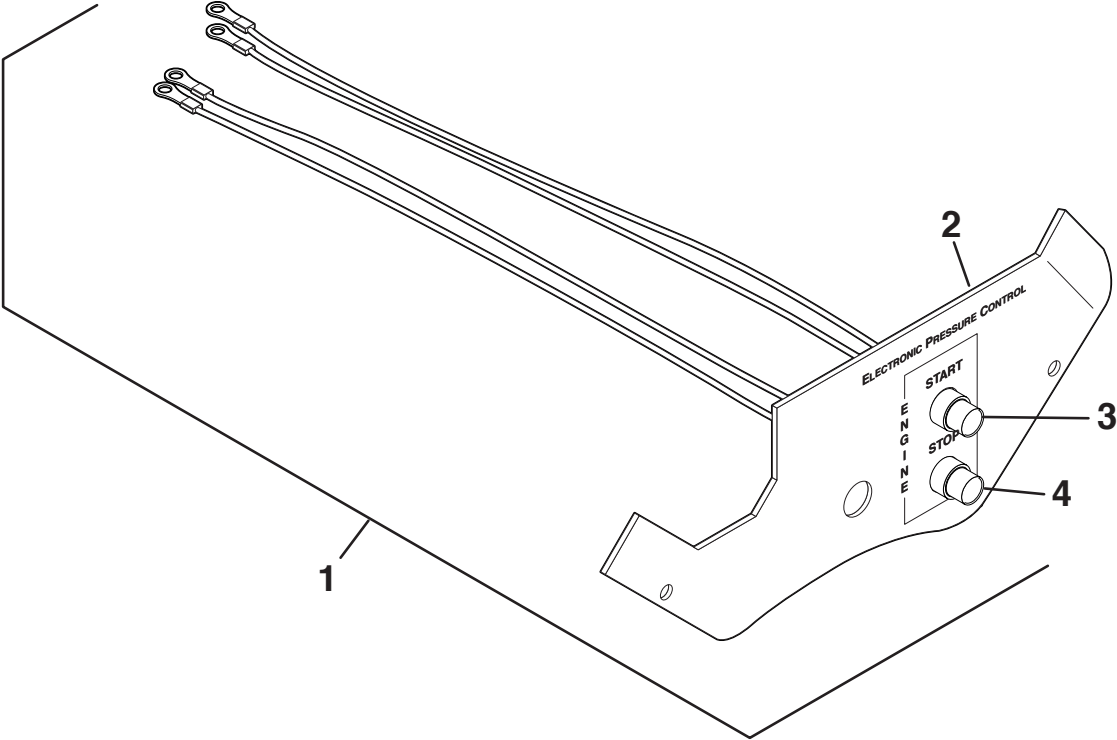
GAUGE PANEL ASSEMBLY

GRIZZLY® ULV SPRAYER

Pos	Qty.	Description	Part No.
1	1	COUPLING COVER.....	12784
2	4	10 - 32 X 3/8" PHILLIPS PAN HEAD SCREW.....	11145Z
3	4	#10 INTERNAL LOCK WASHER.....	11102Z
4	4	6 - 32 X 3/8" PHILLIPS PAN HEAD SCREW.....	11056
5	1	CONNECTION PANEL.....	12786
6	3	GROMMET, CONNECT PANEL.....	12621
7	4	8-32 X 1/2" SCREW.....	11080Z
8	1	14 PIN WIRE HARNESS ASSEMBLY.....	13134
9	4	6 - 32 NYLON LOCK INSERT.....	11052
10	1	MODULE REMOTE ENGINE STOP.....	13317
11	2	8-32 LOCKNUT.....	11077
12	1	POTENTIOMETER AND HARNESS ASSEMBLY.....	13031
13	1	GAUGE PANEL.....	12785
14	1	TINY-TACH.....	12894
15	2	#8 INTERNAL LOCK WASHER.....	11085
16	2	HOSE CLAMP.....	10033
17	1	1/4" X 1/4" MALE HOSE BARB BRASS.....	10328
18	1	T, SPECIAL.....	12694
19	1	HOSE BARB PLATED.....	10882
20	1	HOSE, YELLOW 1/8 ID.....	1-263
21	3	SCEW 6-32 X 1/4" PHILLIPS PAN HEAD.....	11055
22	1	PRESSURE GAUGE.....	10550
23	1	1/4" X 1/8" BRASS BUSHING.....	10330
24	1	PRESSURE SWITCH 1 psi.....	12328
25	25"	1/4" AIRLINE.....	10042
26	1	KNOB.....	10819
27	1	FOAM WASHER.....	1-170
28	1'	HIGH TEMPERTAURE SLEEVE (12").....	13171

ENGINE PANEL ASSEMBLY

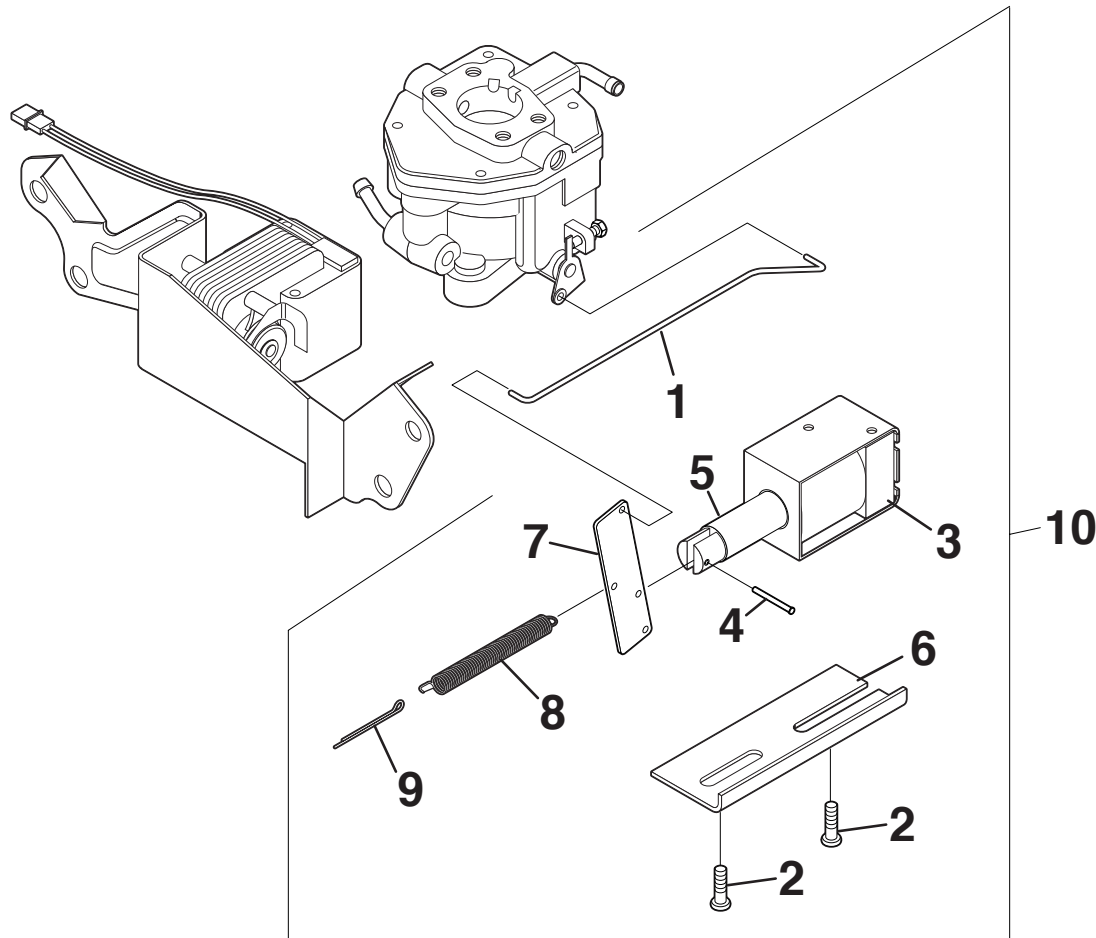
GRIZZLY® ULV SPRAYER



Pos	Qty.	Description	Part No.
1	1	PANEL, ENGINE ASSEMBLY	12637
2	1	ENGINE PANEL, WITH DECAL	12636
3	1	START BUTTON ASSEMBLY	12768
4	1	STOP SWITCH ASSEMBLY	12767
5	12"	LOAM (NOT SHOWN)	10046

CHOKE ASSEMBLY

GRIZZLY® ULV SPRAYER



Pos	Qty.	Description	Part No.
1	1	LINKAGE ROD, CHOKE	12766
2	3	SCREW 8-32 X 1/4" PHILLIPS PAN HEAD	11084Z
3	1	COIL SUB ASSEMBLY	12742
4	1	SPRING PIN 3/32 X 1/2"	11000Z
5	1	PLUNGER, SOLENOID	12764
6	1	BRACKET, CHOKE.....	12759
7	1	ARM CHOKE.....	12760
8	1	SPRING, CHOKE.....	10191
9	1	COTTER PIN 1/16 X 1"	10887
10	1	CHOKE ASSEMBLY (SEE PAGE 53)	12762

TROUBLE SHOOTING

GRIZZLY® ULV SPRAYER

TROUBLE	POSSIBLE CAUSE	REMEDY
Air blast at nozzle but no pressure showing on pressure gauge.	Defective pressure gauge. Air leaks in the air line between the nozzle and the pressure gauge.	Replace. Replace air line or reconnect if loose.
Air blast insufficient or no air pressure at nozzle.	Air leakage around joints on nozzle elbow assembly. Defective blower. Engine speed too low. Filter-Silencer element clogged up.	Tighten knob on side of mast or side of the nozzle head. Repair at nearest blower service center. Set to recommended speed. Clean and service.
Air bubbles in chemical lines.	Fittings crossthreaded, loose or defective between insecticide tank and pump. Line strainer gasket pinched. Pulsation Damper gasket pinched.	Retighten or replace. Replace gasket. Replace gasket.
Air pressure at nozzle but pressure gauge needle will not move when the engine speed is varied.	Defective pressure gauge.	Replace.
Blower trouble.	See blower instruction manual.	See blower manual.
Cannot calibrate to correct flow rate.	Air bubbles in chemical lines. Voltage too low to pump. Battery charge too low. Leaks in insecticide line between pump and nozzle. Pump gummed up.	Eliminate by checking fittings and chemical lines for leaks. Replace voltage regulator. Charge battery. Tighten fittings or replace insecticide line. Flush and if necessary, let pump sit for a few hours with flushing solution in cylinder.

TROUBLE SHOOTING

GRIZZLY® ULV SPRAYER

TROUBLE	POSSIBLE CAUSE	REMEDY
Cannot calibrate to correct particle size.	Air pressure too low, which will produce large particles. Air pressure too high, which will produce small particles. Flow rate too high. Flow rate too low. Nozzle damaged. Temperature too low.	Increase engine speed. Decrease engine speed. Calibrate to correct flow rate. Calibrate to correct flow rate. Replace damaged parts. Calibrate above 70° F.
Chemical drips from nozzle when not running.	Insecticide tank filled completely to top. Pump system running.	Leave a 2" air space at the top of the tank when filling. Defective low-pressure cut-off switch.
Chemical drips from the nozzle while running.	Engine RPM too low. Excessive flow rate. Insecticide tank filled completely to top. If the spray is ON, defective nozzle. If the spray is OFF, insecticide in blower.	Set throttle for correct air pressure at nozzle. Set for correct flow rate. Leave a 2" air space at the top of the tank. Replace. Run to clear blower and flush blower to remove the insecticide.
Chemical flow out of nozzle is noticeably pulsating.	No air dome in pulsation damper.	Check the air dome to make sure it has not become filled with chemical.
Chemical leaks at fittings.	Fittings crossthreaded or defective.	Retighten or replace.

TROUBLE SHOOTING

GRIZZLY® ULV SPRAYER

TROUBLE	POSSIBLE CAUSE	REMEDY
Chemical pump not running when Spray switch is turned on.	Defective Spray switch or loose connectors. Defective Low-Pressure Cut-Off switch. Low-Pressure Cut-Off switch out of adjustment.	Replace. Replace. For field repair, this switch can be “jumped” by connecting a wire between the terminals on the switch. Adjust as shown on page 14.
Chemical pump runs but no chemical flow.	Leak in suction line. Out of chemical. Three-way solenoid valve not opening. Three-way solenoid valve clogged up. Nozzle solenoid valve not opening. Nozzle solenoid valve clogged up. Line strainer gasket pinched. Line strainer plugged. Pump is dry. Pump defective.	Check lines, tighten. Check that both chemical tank and flush tank have solution in them. Check voltage at connector which goes to the solenoid valve. The voltage should be 12 volts. If not, check for voltage at the control panel. Disassemble and clean. Check voltage at connector which goes to the solenoid valve. The voltage should be 12 volts. If not, check for voltage at the control panel. Disassemble and clean. Replace gasket. Clean or replace. Prime with motor oil. Visually check pump for rotation and piston movement. Repair or replace.
Coupling sleeve damaged or thrown.	Misalignment between engine and blower shafts.	Carefully align engine and blower shafts.

TROUBLE SHOOTING

GRIZZLY® ULV SPRAYER

TROUBLE	POSSIBLE CAUSE	REMEDY
Engine backfires.	Gasoline mixture too lean. Defective spark plugs. Inlet valves sticking.	Check carburetor. Clean, adjust and/or replace. Free, clean and adjust valve.
Engine compression low.	Valve clearance improper. Defective cylinder head. Defective valves or piston rings. Cylinder head gasket leaks.	Adjust valve. Consult nearest engine service center. Consult nearest engine service center. Tighten head bolts or replace gasket.
Engine cuts off when the Spray switch is turned on.	Cold engine.	Allow the engine to warm up. Momentarily choke the engine when the Spray switch is turned on.
Engine does not deliver full power.	Carburetor choke valve partly closed. Air cleaner dirty. Carburetor defective. Exhaust restricted.	Adjust choke. Service air cleaner. Clean, adjust or replace. Replace muffler.

TROUBLE SHOOTING

GRIZZLY® ULV SPRAYER

TROUBLE	POSSIBLE CAUSE	REMEDY
Engine hard to start, will not start or fails.	Main Power switch located on remote control box in OFF position or faulty switch and/or wires.	Place switch in ON position or replace faulty switch and/or wires.
	Ignition switch located on engine defective.	Replace.
	Out of fuel or contaminated fuel. Clogged fuel filter.	Add fuel or clean tank and refuel.
	Spark plugs faulty.	Clean or replace fuel filter.
	Fuel pump or carburetor defective.	Clean or replace spark plugs.
	Defective fuel pump.	Consult nearest engine service center.
	Terminals loose or wiring defective.	Repair or replace.
	Spark plug wire disconnected.	Tighten loose terminals, replace defective wiring.
	See engine instruction manual.	Connect spark plug wire.
	Pinched or shorted wiring in the control box.	See engine manual.
		Re-route wires and tape them.

ELECTRICAL SCHEMATIC

GRIZZLY® ULV SPRAYER

